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ONVENTION

WARTIME
ADIO RELAY

/AL ACADEMY
CHOOLING

ONE VOICE
COMMAND

MAY-
JUNE
1949

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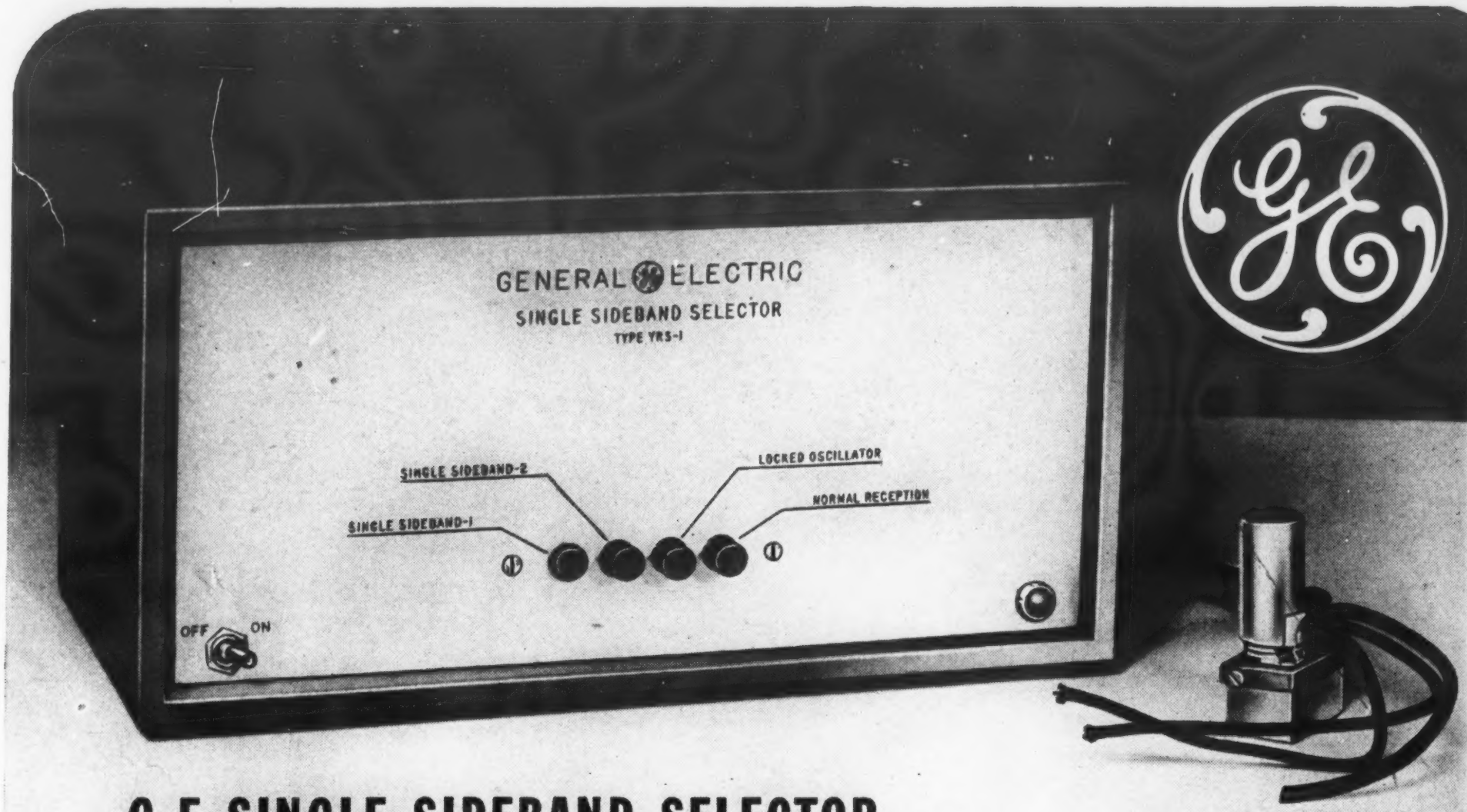

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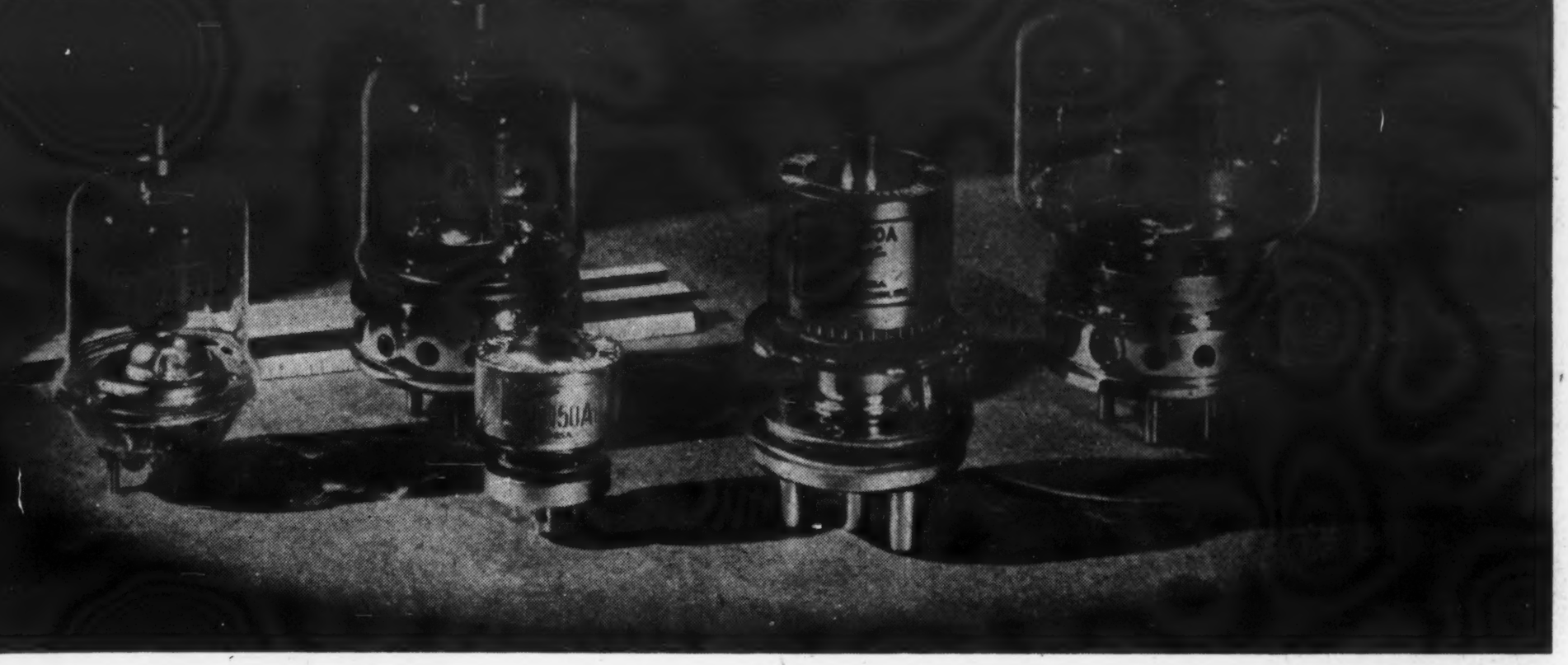

THE 4-65A . . . is the smallest of the radiation cooled Eimac tetrodes. Its ability to produce relatively high-power at all frequencies up to 200-Mc. and over a wide voltage range offers considerable advantage to the end user. For instance the same tubes may be used in the final stage of an operator's mobile and fixed station. Two tubes, in the mobile unit operating on 600 plate volts will handle 150 watts input, while two other 4-65A's in the fixed station will provide a half kilowatt output on 3000 volts .

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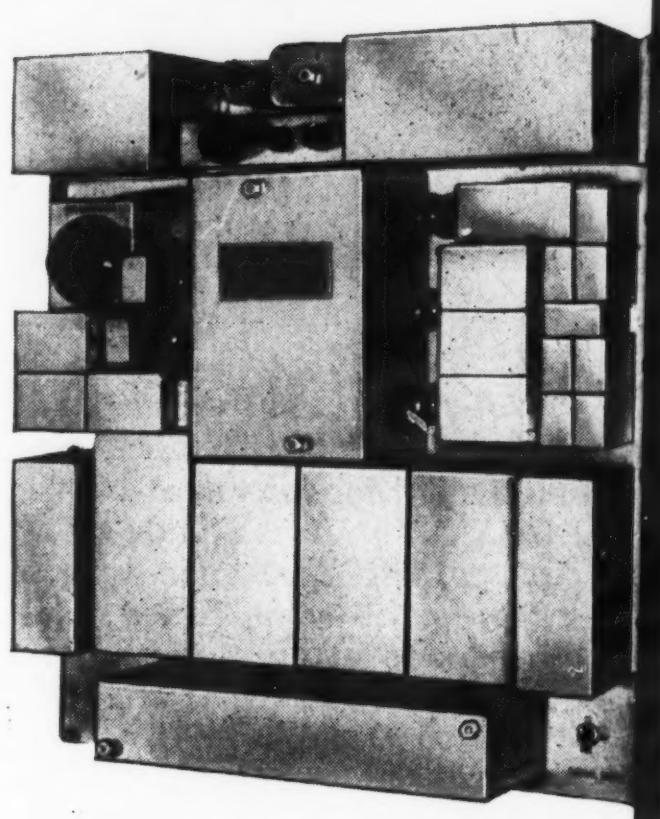

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VOLUME 3 | MAY-JUNE, 1949 | NUMBER 5

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SIGNALS is published bi-monthly by the Armed Forces Communications Association at 1624 Eye St., N. W., Washington 6, D. C. Entered as second-class matter at Post Office, Washington, D. C., September 6, 1946, under Act of March 3, 1879. Additional entry at Baltimore, Md.

Subscription rates: 1 year (6 issues), $5.00. To foreign post offices, $6.00. All rights reserved. Copyright 1948 by Armed Forces Communications Association. Reproduction in whole or in part prohibited except by permission of the publisher. Printed in U.S.A. by Monumental Printing Co. at Baltimore, Md.

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THE COVER

Among the many types of antenna shown in our cover photo, aboard a U. S. Navy aircraft carrier, there are several radar systems represented. How many can you identify?

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LEARNING AT THE NAVAL ACADEMY—

THE ACADEMIC DEPARTMENTS AND SYSTEM OF INSTRUCTION

By Senior Professor Earl W. Thomson
U. S. Naval Academy

Contrary to the opinion of the newspapers, the registrar, the dean of admissions, the alumni, and the coach of the football team, the real worth of any educational institution still is evaluated in terms of its academic departments and its teachers. A successful football team increases the publicity factor and the number of the "subway alumni"; excellent buildings, a well laid out campus, and beautiful co-eds enhance the photogenic factor; rabid alumni throughout the years assist the esprit and the morale. But the college still remains an educational institution, and will be judged among educated men on the knowledge, scholarship, intellectual achievements, and leadership ability of its graduates.

The seat of this learning in modern colleges is in the academic departments. We have become departmentalized as the breadth of learning has increased. The transmitters of this are the instructors who are good teachers; the receivers are the students who are motivated sufficiently to learn. The "tuning" between the transmitter and the resonant receiver is the "process of education."

Faculty of Seven at Start

In 1845 when Commander Franklin Buchanan started the Naval Academy with about "half a hundred midshipmen and seven schoolmasters," the subjects of the curriculum were divided among six departments: Gunnery and Steam; Mathematics and Navigation; Natural and Experimental Philosophy; Chemistry; History and English Studies; French and Spanish. Each Professor was his own head of department—in fact the whole teaching staff of the depart-

A graduate in Physics and Mathematics at Clark University and Dartmouth College, with postgraduate work at the University of Chicago, Johns Hopkins University, and Massachusetts Institute of Technology, Senior Professor Thomson has been a member of the civilian faculty of the Department of Electrical Engineering at the Naval Academy since 1919. In World War I he was a captain in the Coast Artillery, and in World War II he was a colonel in the General Staff Corps, seeing service in England with the Anti-Aircraft Command, VIII Bomber Command, and as Flak Officer and Chief of Intelligence, Eighth Air Force. The last year of the war he served as Chief of the Flak Intelligence Section of the Joint Intelligence Center, Pacific Ocean Areas.

This article in large part is reprinted with permission from the April 1948 number of the *United States Naval Institute Proceedings*. It has been brought up-to-date by the author for SIGNALS.

In preparing this article the author visited all the academic departments of the Naval Academy and interviewed the various heads of departmnts and the executive officers. These officers are justly proud of their departments. You will see this reflected in this article in the reports on certain of the academic departments on courses, teaching methods, and equipment.

ment. One lowly "passed midshipman" completed the faculty.

Fourteen years later, in 1859, the Official Register of the Naval Academy reported that there had been a reshuffling of subject matter and that the departments had been increased to nine: Mathematics; Natural and Experimental Philosophy; Ethics and English Studies; Drawing and Draughting; French; Astronomy, Navigation and Surveying; Field Artillery and Infantry Tactics; Spanish; Practical Seamanship, Naval Gunnery and Naval Tactics. In 1858 the Professor of Drawing doubled as the "Teacher of the Art of Defense." The Commandant doubled or rather quadrupled, as instructor in Seamanship, Naval Tactics, and Practical Gunnery. You will see that in those early days the name of the department and its courses depended somewhat upon the interests and capabilities of the professors and the available officer instructors.

A Century Later

One hundred years later the midshipmen have increased to 3,319, the officer instructors to 291 and the civilian "professors" to 182 for a total faculty of 473, and the departments, with the addition of Aviation in 1945, only to eleven. There has been a continuous reshuffling of responsibility for courses and subject matter: French and Spanish, despite their early divorce, have been remarried in Foreign Languages; Natural and Experimental Philosophy was changed to Physics and Chemistry and then absorbed by that upstart, Electrical Engineering; the "Art of Defense" is now Physical Training; Field Artillery has been "sold down the river" to the Army and the Marines; Ethics and English Studies has become English, History and Government as the repository of most of our humanistics; Infantry Tactics is now a small part of the interests of the Executive Department. Only mathematics has remained unsullied through the century.

Most of the changes in the Naval Academy in the last decade have been within these departments. These have been changes in course material brought about by changes in the overall curriculum of the Academy, omission of duplicated or obsolete material, inclusion of modern ideas and subject matter, changes in methods of teaching, and changes in laboratories and equipment.

In writing this article all the Naval Academy academic departments were visited by request of and with the approval of the Superintendent, Rear Admiral Holloway and the various heads of departments and executive officers were interviewed. These officers are justly proud of their respective departments. You will see this reflected in the following reports from certain of the academic departments on courses, teaching methods, and equipment.

Electrical Engineering

The Department of Electrical Engineering, the direct descendant of Natural and Experimental Philosophy, is really a department of basic sciences. It teaches Chemistry to the plebes, Physics to the youngsters, Electrical Engineering to the second and first classes, and Electronics to the first class. At the present time the Departments of Marine and Electrical Engineering are the largest in the Academy on the basis of hours of midshipman time and personnel. Few major changes have taken place in the past decade, the recitation rooms being supplemented as before by the laboratory in each subject and by occasional demonstration lectures.

With the birth of the atomic bomb, chemistry has expanded its course to include atomic structure, with both the nucleus and the spinning electrons represented. The chemistry laboratory has been improved with the addition of more quantitative experiments, and the semimicro technique during eight weeks of qualitative analysis. No longer is the laboratory theme "Pour them together and then pour the mess down the sink." The chemistry course is the equivalent of a good, standard, general freshman chemistry course as required in the leading engineering schools.

Basic Electronics

The second year of a midshipman's life still finds the youngster wrestling with the problems of general physics, backed by work in the laboratory and a leavening of demonstration lectures. The third year finds the Second Class studying electricity and magnetism from a theoretical or basic viewpoint, this being followed by a concentrated course in electrical engineering in which the laws of circuits and the characteristics of machines are emphasized.

The old course in Radio has now been absorbed in one called Basic Electronics given in the last five months of the first class year. The principles of vacuum and gas-filled tubes, with the accompanying circuits, are well covered, both in the classroom and in the laboratory. The old motor-generator laboratory in the basement of Mahan Hall has been converted into an electronics laboratory, with different voltages and frequencies, including 3,000 megacycles piped to the different tables. Oscilloscopes are used by every midshipman in this laboratory, as electronics controls and circuits depend so much on this instrument. An addition has also been made of an Electronic Barge, moored to the sea wall off the practice football field. In this the midshipmen spend several periods learning the intricacies of loran, sonar, radar, and other naval control equipment, much of which is confidential.

This department has been a leader in less - marks - for - midshipmen, in courses at the Academy and other institutions for officer and civilian instructors, and in visits by the faculty to other colleges and to scientific meetings. However, as these are covered elsewhere in this paper, credit only can be given here with the discussion postponed.

Seamanship and Navigation

The Department of Seamanship and Navigation, being a professional department, utilizes the "Learning by Doing" technique. This aim is to merge the processes of education and training so that the student progresses from the study of theory to the practical application of knowledge in operating techniques and procedures, meanwhile acquiring a comprehension of tactics, maneuvering, communications and related subjects. From the beginning of Plebe Summer when the eager plebe learns to qualify for command of small sailboats, to the end of first class year when he is sufficiently grounded in celestial navigation to practice efficiently at sea, the midshipman is kept busy learning by actual experience. During Plebe Summer the new midshipman is taught the language of the sea and elementary seamanship. Third class drills see the youngsters in complete control of small boats, both sail and power. Drill periods of first and second class year are in 75-foot twin-screw patrol boats that have engine controls and handling characteristics comparable to larger vessels. There are eight of these patrol boats available, equipped with radar and gyros so that radar navigation, tracking and tactics may be practiced. In addition, the yawls that the midshipmen use for recreation and racing are used for drills. The final instruction in seamanship is given during the second term of first class year, being largely on rules of the road, weather, maneuvering, elementary and advanced tactics, communications and operations.

In Navigation the midshipman progresses, in second class year, to the point of being able to do a day's work in navigation on the following summer cruise. The classroom work is concerned mainly with the theory of astronomy and the solving of the astronomical triangle to obtain a line of position. This part of the course follows immediately after a course in spherical trigonometry in the Department of Mathematics. Modern methods of tabulated computations from prepared tables are utilized. Practical works are given every other week during the navigation course, from the beginning of second class year to the middle of the first class year. The department is equipped with 900 desks similar to the ship navigator's work desk, each with its individual drafting machine. During first class year basic air navigation is studied, and celestial navigation is continued. Navigation by means of loran and radar brings in the modern electronic methods.

Combat Information Center

The department uses many training devices. The loran trainer, the submarine attack trainer, and the emergency shiphandling unit employ electronics, while the compass compensating and basic seamanship devices are primarily models. The most efficient and realistic training devices, however, still remain the boats, power and sail. The latest advance has been the inclusion of Combat Information Center drills. These are integrated with summer cruise training during which the midshipmen learn DRT (Dead Reckoning Tracer) operation and plotting, PPI (Plan Position Indicator) interpretation, air plotting, surface maneuvering, and station keeping, with sound-powered phones and voice-radio communication. During the academic year the drills cover air plotting and air defense control, maneuvering, informations, combined air and surface problems, and practical shipboard CIC operation. The equipment for these drills is quite extensive and duplicates very closely actual installations and operations aboard ship.

Throughout the four years the drills are integrated, as much as practical considerations of weather and scheduling will permit, with the classroom work so that the theory of each operation will be applied immediately in practice.

Ordnance and Gunnery

The Ordnance and Gunnery Department is faced with a very stimulating challenge. Within one month after attending their last class as midshipmen, the majority of Academy graduates will be assigned gunnery duties as junior officers. Meeting this challenge determines the broad policy for the department—a thorough knowledge of the equipment most common in the fleet, and a basic foundation of fundamental principles so complete that any other equipment can be quickly mastered.

The incoming Plebe has a speedy and painful introduction to Gunnery as he strains young muscles to accustom them to the firing positions on the rifle range under the eyes of crack-shot Marine coaches. Before the summer is over, he has "broken-down" and fired all types of small arms and usually he has qualified as Expert, Sharpshooter or Marksman. Actually he lives with his rifle,—the M1 or Garand,—in his room and is responsible for seeing that it is always cleaned and ready to fire. After this intensive 77-hour indoctrination as a rifleman, the midshipman receives no more ordnance and Gunnery instruction until second class year, except for practice firing and instruction on the summer cruises.

As a second classman, the midshipman starts his formal classroom instruction with the study of Ordnance,

Midshipmen going aboard the Electronics Barge for practical instruction in radar, sonar, and loran.

or the material involved. This includes explosives, projectiles of all kinds, the various types of guns and projectors, and in addition, torpedoes, mines, rockets and guided missiles.

Fire Control

During first class year, he learns what the fire control problem is, and the method of solving it mathematically, graphically and by mechanical computers. Starting with the surface ship target, he studies the main battery system and for air targets he covers the system of control for 5" guns and for light machine guns.

Step by step, as he covers the theoretical aspects of the subject in the classroom, he is observing and using the actual equipment in carefully coordinated drills. With each battery, the ultimate exercises find the midshipmen manning all gun and control stations and going through actual tracking exercises against live targets,—surface ships and planes,—in which midshipmen do everything but fire the guns. An intensive program of actual firing is included during the summer cruises.

The department is equipped to provide training on the standard shipboard installations with a main battery system in Dahlgren Hall, dual 5 inch 38 caliber control systems on the seawall where also are located the machine-gun control systems and radar trainer. For Shore Bombardment which was so vitally important in the last war, a special Shore Bombardment Trainer is available. Here, the midshipman control officer can direct his fire from shipboard control equipment and spot his salvos as he watches the smoke rise at their point of fall on an elaborate terrain model. He can tie-in in aerial observation, and for night firing he can illuminate his terrain with star shells.

To show the integrated plan of instruction, when the midshipman takes up basic mechanisms, for example, he will study them in the text before class. In the section room, the instructor will then go over any difficult points in the operation of the mechanisms. The midshipman will cover in his own words, questions based on the equipment. He will then go over his work for the benefit of the section. At the corresponding drill, he will see a film showing how all the mechanisms fit together to form a simple computer. He will also see a demonstration or "breadboard" model showing the same computer laid out flat so each mechanism can be plainly seen and each connecting shaft easily followed. When power is turned on and a problem set up, he can see the actual computation being made. Finally when he goes to the actual equipment, there is some reason to what would have otherwise seemed confused jumble of shafts, gears and mechanisms.

At the end of the first class year, time is devoted to passing on last words of caution and advice. The midshipmen who have by then been assigned to duty aboard specific ships sense at last that this is not just material to be hastily crammed to pass a final exam. They are stimulated by the thought that after a short month of leave, they must teach others to do what they have just been studying—that instead of merely a course of study, this is actually their professional equipment on which the success of their future Naval careers will depend.

Aviation

The Department of Aviation is the youngster among the departments at the Naval Academy, having been founded in December, 1945, by order of the Secretary of the Navy. The department does not attempt to make aviators or aeronautical engineers out of the midshipmen; the time allotted is far too short. Rather, the midshipman is given an insight into what goes on in an airplane in the air, so that he will be able to understand the airman's viewpoint and be able to see the position of the air arm in the over-all strategical and tactical picture. The subjects given in the survey courses on naval avaiation and flight indoctrination include basic aerodynamics, communications, naval aviation history and organization, and aerology.

During plebe summer each midshipman is given six hours aviation drill including flights in a primary trainer and a multi-engined plane, stressing the importance of proper equipment, safety precautions, and flight physiology.

This past summer the aircraft carrier *Coral Sea* took the midshipmen of the second class on the aviation summer cruise. One-half of the available instruction time on this ship was given to Aviation, with the remainder divided among Marine Engineering, Ordnance and Gunnery, and Seamanship and Navigation. The midshipmen averaged 4.5 flights in catapulted and free-flight planes. The remainder of the time was spent in learning and observing the duties of the aviation enlisted men in handling gear, rearming, and in problems of aircraft operation.

The Naval Air Facility on the north side of the Severn has available PBY multi-engined Catalinas and N3N trainers for midshipman drills during the fall and spring terms of second and first year class years. Flight activity is limited by the necessity of using obsolete and obsolescent aircraft of the seaplane and amphibious types and by the limited size of the Naval Air Facility. The crying need at the moment is a naval air station where the latest landplane and seaplane equipment may be operated and demonstrated. It is necessary to inculcate in the midshipmen the thesis that the air is as essential an operating medium as the sea, and that control of the sea is not complete without control of the air above it. Lacking an adequate airfield this cannot be fully realized.

In the winter months recitations

Instruction on sonar mechanism.

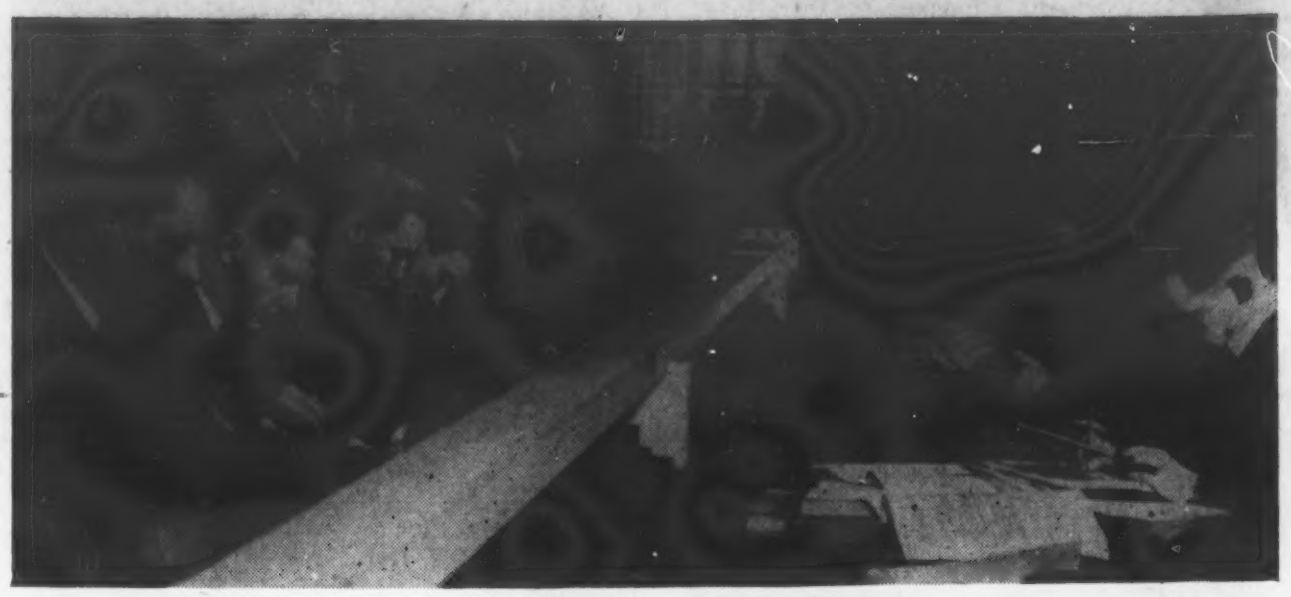
are held in the Aviation Building, the teaching being by the lecture method with not a great deal of study-recite. A good deal of aviation equipment is demonstrated, movies being used whenever possible to cut down the amount of reading necessary. With these modern methods in teaching, and the program of actual flight participation, the department is doing an excellent job in bringing aviation to the midshipmen.

The Executive Department

The early days when the Commandant not only was dictator of discipline, but also an instructor in seamanship, naval tactics, and practical gunnery have gone with the tide of time. Now the Commandant is head of the Executive Department, with many varied duties, but has 50 officers to assist him. The officers of this department handle the disciplinary problems of the brigade, under the listings of "conduct" and "aptitude for service," oversee the infantry drills and parades, publish the orders for internal administration of the brigade and Bancroft Hall, act as guidance and personal counselors and as company and battalion officers, and teach the new course in Leadership.

The Naval Academy is pioneering in the development of a course on the principles, psychology, and techniques of leadership. The course has been given time in the crowded curriculum for recitation and study, and is treated as a regular academic subject. The company officers of the Executive Department have been detailed as instructors. The main method of instruction is by group discussion of typical cases and simulated situations, the discussion being by the midshipmen, with the officers acting only as moderators. It is emphasized continually that leadership presupposes proper discipline. The subject is approached from the scientific background of psychology, which teaches that leadership is successful only when the relationships between individuals of different motivations and reactions are properly understood. There are those who still insist that leadership cannot be taught, that "leaders are born, not made," but the experience of war training has proved otherwise.

A textbook called *Naval Leadership* has been prepared in three parts. Book I is on the "Principles of Naval Leadership"; Book II on "Psychology for Naval Leaders," has been written by members of the Department of Psychology at the University of Maryland; Book III, on "Techniques of Naval Leadership," has been prepared by the Executive Department. It is the plan of the department to publish this as one volume after the material has weathered the trials of one year's usage in class.



Laboratory experiment in electronics. Experiment being performed at left is on "Resonant Coupled Circuits" — at right is on "Triode Vacuum Tube Characteristics."

The leadership course has had several salutary effects: it has required the members of the executive and academic departments to act as living, speaking, acting examples, and it has thrown the gauntlet of leadership fairly into the hands of the first class.

The remainder of the educational world will watch with interest the experiment of the Naval Academy in teaching leadership in the classroom in conjunction with its practice in the brigade.

Plebe Summer

A plebe enters the Naval Academy full of enthusiasm for the naval service and eager to begin his training and education toward becoming a naval officer. All training during plebe summer is directed toward encouraging this enthusiasm and fostering a love for the Navy. To accomplish this purpose Plebe Summer bridges the gap between civilian life and military life.

The new plebes start entering the Academy the Monday following graduation and the embarkation of the upper classes on summer cruises. From his admission until the last week in September each plebe is kept busy learning the ways of the Naval Academy through infantry, boat and ordnance drills, indoctrination in naval customs and traditions, and is being prepared for the approaching academic year through remedial English and refresher courses in English and mathematics, with a few lessons in hygiene and placement tests in language. He learns how to budget his time for study and extra-curricular activities, he is given supervision in how to make good use of the library, he learns how to be both student and midshipman, officer and gentleman. There is not a civilian institution in the country which would not give much for the ability to engage its freshmen in a three-months counseling and orientation period similar to plebe summer.

For a plebe who enters early in June, 128 hours are spent with the Executive Department, 84 with Seamanship, 77 with Ordnance and Gunnery, 90 with Marine Engineering, 42 with English, 25 with Mathematics, 6 with Aviation, 6 with Languages, and 4 with Hygiene.

The Department of Ordnance and Gunnery is justly proud of its record in training and qualifying plebes on the rifle range. During the summer of 1947 90 percent of those firing qualified with the .30 caliber M-1 rifle, 93 percent with the .30 caliber M-1 carbine, and 78 with the .45 caliber service pistol. Seventy-five Marine noncoms, especially picked and trained, acted as coaches and generally assisted the officers detailed for rifle range duty. Each midshipman was given a week's instruction complete with movies and other training aids before firing. Experience shows, however, that the best training aid is the weapon itself—that is the "real McCoy."

Each fourth classman is issued a booklet of Special Instructions which covers all the aspects of a plebe's behavior from haircuts to shoeshines, from dope sheets to "luggage stowage of"—from "A—Accountability" to "Y—Yard, Restricted Areas." Without this "bible" the life of a plebe in the old days must have been a series of errors.

Summer Cruises

The midshipman year is divided into eight months of academics, three months on a summer cruise, and September leave. After five war-years of different time patterns this traditional pattern is again being followed. In civilian colleges, particularly engineering institutions, the summers are assigned to surveying or hydraulic camps, extended trips through industries, actual mining practice for the embryo mining engineers, cooperative courses in the factories and carrying ice for the football All-Americans.

At the Naval Academy this valuable time is spent on summer cruises. The Academy authorities recognize that the ships of the Fleet are the best laboratories for practical instruction in naval operation. The cruise becomes the major operational training phase of our undergraduate education. The philosophy of the cruise is "learning by doing." The summer cruise does not consist of academic classrooms transferred to shipboard. The keynote of all cruises is active midshipmen participation at the shipboard division level. The level of training is that of junior officers, petty officers, and the enlisted men. It is not intended that the cruises make competent watch officers, nor that it make tactiticians. The cruise affords practical experience on board the latest types of naval vessels wherein there is an opportunity to put academic instruction of the previous year into practice and actually to participate in the operation of the modern man-of-war. Midshipmen are completely integrated into the shipboard organizations and fully participate in the operation of the ships.

Also, we must not fail to see the advantages gained in the projecting of midshipmen into wider horizons of associations with foreign peoples, customs, and countries. On the 1948 cruise the midshipmen visited numerous ports of southern Europe and northern Africa. The battleship *Missouri*, the aircraft carrier *Coral Sea*, two heavy cruisers and eight destroyers embarked the three upper classes immediately after graduation. The second class, or new juniors, were on the aircraft carrier,—their training included indoctrinational flights in the aircraft attached to the huge carrier. The destroyers carried first classmen, and the battleship and the cruisers the youngsters and remaining first classmen. Naval Reserve midshipmen, from eleven of the fifty-two colleges associated with the Naval ROTC program, joined the cruise at Norfolk. These midshipmen, nearly seven hundred strong, were integrated into the Naval Academy midshipmen organizations aboard the carrier and the cruisers. Thereafter their identity as reserves was lost, until the middle of the cruise, when they were all transferred to one cruiser for transportation to Norfolk and leave.

Instruction in the function of Combat Information Center. Apparatus shown is the dead reckoning tracer, and the status boards.

Foreign Ports Visited

In 1947 ships of the cruise visited Rosyth, Oslo, Goteborg, Copenhagen, Portsmouth and Plymouth. In 1948 each ship visited three of the following ports in European waters: Lisbon, Villefranche, Genoa, Leghorn, Algiers, Casablanca, and Gibraltar. Prior to arrival at each port lectures were given on the customs and traditions of the peoples to be visited, short language lessons were conducted, and literature about the ports was distributed. During the visits in port, sightseeing tours were arranged for those desiring them. Often the tour was able to visit nearby large and interesting cities. Rome, Florence, and Paris were visited by midshipmen from the cruise ships in 1948. The last month of the cruise was devoted to intensive shipboard training off our Fleet Training Base at Guantanamo Bay, Cuba.

The cruise instruction was divided, into gunnery, engineering, seamanship and navigation,—and in the *Coral Sea*, aviation and flight training. Sixty-nine officers from the Naval Academy accompanied the cruise to assist the ships in their job of training and instructing the midshipmen. There was no classroom instruction. The performance of actual duties and operations, supplemented by lectures and demonstrations, drills, watch standing, and gun firing provided for the summer schooling. All guns, from twenty millimeter to sixteen inch, were loaded, controlled and fired by midshipmen. Practices varied from antiaircraft to shore bombardment.

Each first classman, or senior, devoted one-third of the cruise to practical navigation. During this time he was required to obtain fixes of the ship by celestial navigation, to keep the position plotted, if on soundings or piloting, and to perform all other duties of a ship's navigator.

Sub and Anti-Sub Training

Two special features distinguished our last two cruises from those of earlier days. The first was the training in submarine—ASW (anti-submarine warfare) operations. Each midshipman of the first class made a three-day cruise in a fleet submarine. During the cruise frequent dives were made, day and night approaches were made on targets, torpedoes were fired, live depth charge drops were experienced, guns fired, and an instructional photographic reconnaissance of a coast line was made. The midshipmen lived as crew members, and performed such operations as safety of the vessels permitted. At the same time other first classmen were taking their turn in destroyers operating with the submarines. They were wit-

nessing the other side,—the anti-submarine work of destroyers. They experienced the thrill of locating the submarine's approaches, and her evasive maneuvers.

At the same time, the second class, having disembarked from the carrier, were engaged in Operation Camid III. With their contemporaries from West Point, they were taking part in a combined operation demonstrating a phase of a major landing by amphibious forces. Operation Camid III, as were Camid I and II, was conducted in the Chesapeake Bay and off the Virginia Capes. Units of the amphibious forces of the Atlantic Fleet, the Marines, the Army, and the Air Force joined to make this exercise of value to both midshipmen and cadets.

The tradition of a few months away from the academic rigors of Annapolis is one which should never be abolished; it is indispensable to both the midshipmen and their instructors.

Sectionalizing by Ability

Our sister institution, West Point, has for years sectionalized its classes by ability, this distinction between "engineers" and the "goats" even being carried into intramural athletic events. The question of whether or not to divide into "savvy" and "wooden" sections is a much disputed one at the Naval Academy, and the decision has been left to the respective heads of departments. In Marine Engineering the first and second classes are so divided; in Electrical Engineering the third and fourth classes. In Languages there are advanced courses in French and Spanish, with a "top" section in German. The advantages of sectionalizing are said to outweigh the disadvantages in many departments, so that we shall see the "savvy-wooden" combination and "balanced" sections for years to come.

Middie sees via the oscilloscope the action of coupled circuits used in radio communication equipment. These "side-shows" with the oscilloscope assist the midshipman in understanding the curves that he has plotted by a step-to-step method.

Special Lectures

Admiral Holloway, in the preface of a recent pamphlet announcing the "Special Lectures," stated well the *raison d'etre* for this centralized series being given the first class:

"It is in order . . . that we lift our eyes, periodically though briefly, from the tactical area of current academic commitment to the bold strategical outline of the future. Such views will indicate the challenging problems and areas of command, administration, and naval statesmanship due to unfold with ever widening interest and increasing impact as your careers develop."

With this in mind the Friday evening lectures to the first class, from November to May, have been coordinated into one series, with divisions in the social-humanistic, the operational, and the technical areas. The breadth of these lectures extends all the way from a philosophical discussion on "Changing Patterns of American Thought," an historical treatment of "The Constitution" by the Governor of Maryland, and a study of "Nuclear Science and Engineering," to a lecture on "Logistics" by the Commandant of the Industrial College of the Armed Forces. This series of lectures more than any other single item should span the gap for the graduating midshipmen between life at the Academy and life in the Fleet and in the world.

Conclusion

The above discussion, centered around the academic departments of the Naval Academy, has been specific and factual rather than broad and generalized. It has shown that these repositories of courses and curricula are changing dynamic bodies governed by the laws of motion, rather than fixed static masses following the laws of inertia. There exists no equilibrium of educational forces at the Naval Academy—change and movement remain the order of the day.

When the infant Naval Academy was born in 1845 it was not expected that the courses and methods of study would remain unchangeable. The same thought was expressed much better by Edmund Burke: "Nothing in progression can rest on its original plan. We might as well think of rocking a grown man in the cradle of an infant."

Learning calibration of the PPI oscilloscope aboard the electronics field laboratory (the electronics barge).

And yet, "the more it changes, the more it remains the same." The traditions of the Navy form a permanent backdrop for the Naval Academy and its personnel.

One of these traditions relates to the nicknames of the various academic departments we have been discussing. The Department of Ethics and English Studies in 100 years has become English, History, and Government—but to the midshipmen it still remains "Bull." Gunnery and Steam has finally become Marine Engineering—but no matter whether the course is Draughting or Thermodynamics, it is still called "Steam." Languages is, of course "Dago," and Physical Training abbreviates to "PT." When the Departments of Physics and Chemistry and Electrical Engineering were consolidated, the midshipmen merely considered it a union of "Skinny and Juice." Time floats on, but the collegiate mind remains sophomoric in misnaming with undue familiarity the dignified departments to which it pays homage.

The Departments of the Naval Academy have grown through educational evolution into worthy successors of their ancestors of 1845. The courses, the methods of instruction, and the members of the faculty have changed. World War II has done nothing toward discounting this necessity for change, nor to dim the traditions of a century-old Naval Academy.

EDITORIAL

MEMORIAL DAY, 1949

Nowhere in the United States does Memorial Day have quite the significance that it has here in the Nation's Capital. The solemn ceremonies in honor of our hero dead that are conducted each year in Arlington are immensely impressive. This year visitors there will note greater changes than in any preceding year. During the months that have just passed, the Washington newspaper reader has been reminded each day of the terrible toll of war, for no day has passed without an account of the reburial in Arlington of one or more splendid young Americans who made the supreme sacrifice in the far-away places of World War II combat. Some 140,000 of these heroes are home now, many of them in the cemeteries nearest their boyhood homes. Those of us who go to Arlington, or other cemeteries this Memorial Day, and those thinking Americans who pay homage to the dead in some other way, will renew their determination to help to keep America strong so that another war cannot be.

This year General Pershing, the great leader of World War I, lies over the river in Arlington. Many thousands will visit his grave and pay tribute to him and the thousands whom he led in that earlier world conflict.

Our friends in far off lands will visit the cemeteries where so many of our boys will rest forever. The feelings of these friends are expressed so beautifully, as only the French can do, in a scroll recently sent to our Association's National Headquarters by French Division General L. Merlin. He tells how once each year the former "Telegraphistes" visit the "touching cemetery of Suresnes" and "during this pious act they never fail to walk in a procession, passing close to honor their comrades-in-arms, the American soldiers who died for the defense of France, for the glory of the United States of America and for Liberty. . . . This pious souvenir embodies in a common feeling of gratitude, the men of France and of the United States of America who died during the two wars of 14-18 and 39-45, and the French Signal Corps of the U.S.A."

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In another cemetery here at home there lies a great religious man, an eloquent preacher, who when he died suddenly in January was the Chaplain of the Senate—Dr. Peter Marshall. We might well reflect on these quotations from an inspiring sermon he preached some months before his death:

"If the sacrifice of 300,000 Americans who gave their lives in the war is not to be in vain, then a lasting peace must be secured, justice must prevail in all the world, and righteousness is the only soil in which these things can grow. We know that—we heard it in 1918. We believed it then—but did nothing about it.

"The plain fact is that there can be no peace where there is no righteousness. The Bible has been telling us that for centuries. That is God's truth. Peace is a fruit of righteousness. How then can there be peace anywhere in the world until there is righteousness among the nations? How can there be peace in any human heart where there is wrong thinking and wrong living?

"Reinhold Niebuhr declared. . . 'It is more important to make our cause so just that it will win the allegiance not of the comfortable, but of the insecure and impoverished.'

"To make our cause so just—what is our cause? Do you know—you who fought for it overseas, who braved the sniper in the jungle, who flew through flak-filled skies, who waded through the mud of Italy, who have known the heat of the desert sun and the cold of the North Atlantic? Do you know—you who made your speeches in Congress and waxed eloquent on the stump? Do you know—who boast of your ancestry and have membership in patriotic societies? Where is America going?

•

"Ours is a covenant nation, the only surviving nation on earth, I believe, that had its origins in the determination of the Founding Fathers, to establish on this continent a settlement 'to the glory of God and the advancement of the Christian faith.' This country was founded in religious faith.

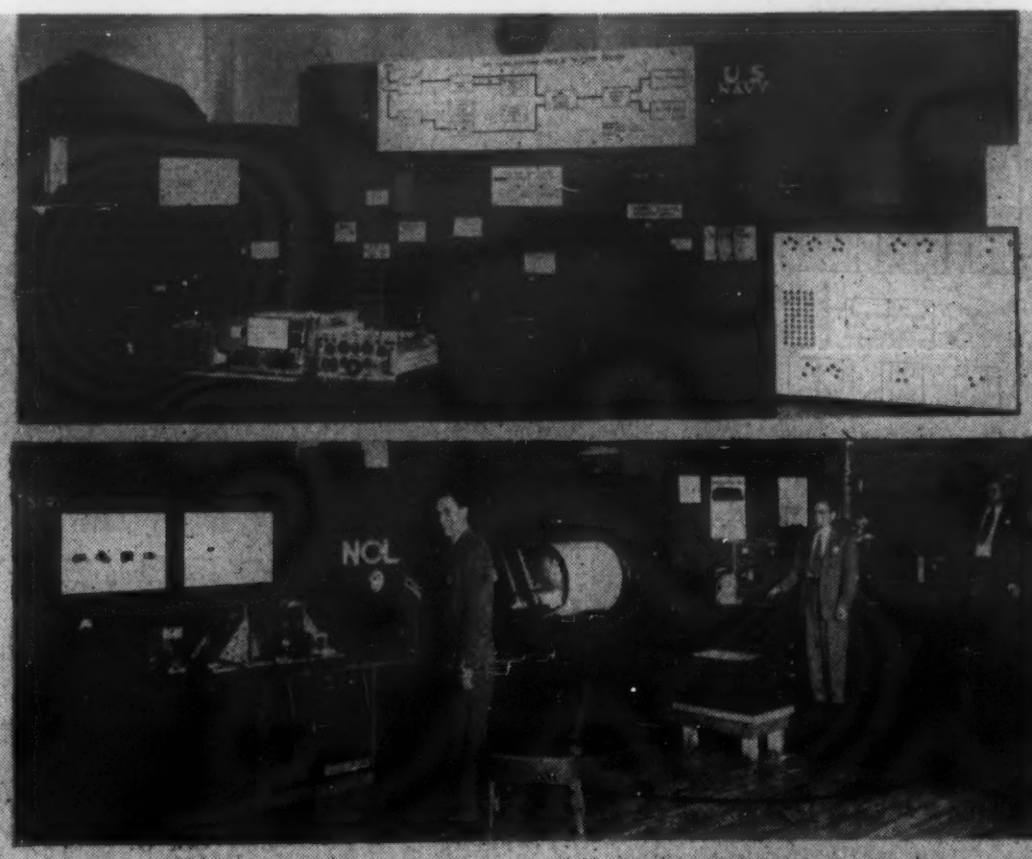
"This is the war that is not yet over. We are in it. God help us to win this one, too, that we may not lose the other one."

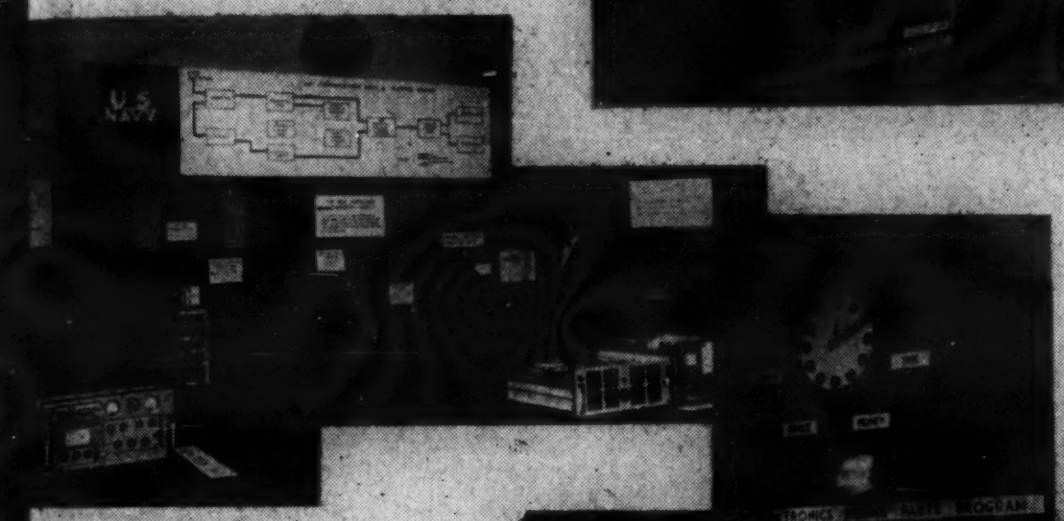
We need the vision and sacrificial effort that enabled our founders to make our Nation great. It behooves our generation to carry on the great American tradition and thereby preserve for our beloved Nation the quality of moral grandeur. Memorial Day is a day of humility—the humility of those whose very existence has been purchased by the deaths of the brave men in whose remembrance we gather on this day. It is appropriate for us to consider what we can do to carry out the great objectives for which they died.

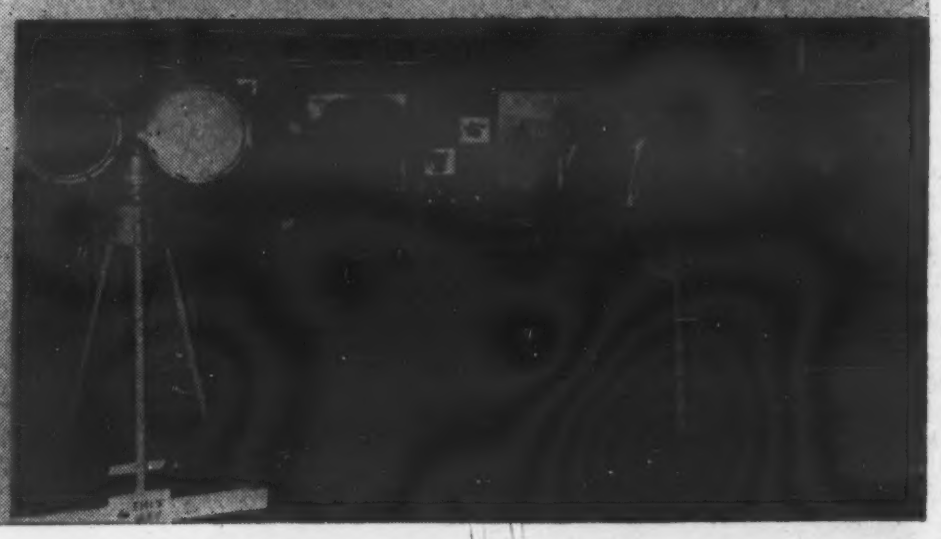
Photos—AFCA 1949 CONVENTION, WASHINGTON, D. C.

The Navy put on a big show for the AFCA meeting. Excepting for the showing of two communications vessels at the Naval Gun Factory, the displays were all in Anacostia, across the Anacostia River from Washington. Exhibits there were set up at the Naval Research Laboratory and the Naval Air Station.

On this page are shown scenes at the Laboratory as personnel awaited the arrival of the AFCA visitors. Upper left corner, greeting the visitors at the entrance to the Lab, are L to R: Captain F. R. Furth, Director of the Naval Research Laboratory; Rear Admiral Joseph R. Redman, former Chief of Naval Communications, and now a vice president of the Western Union Telegraph Co., and Comdr. E. J. Fahy, who was in charge of setting up the exhibits.

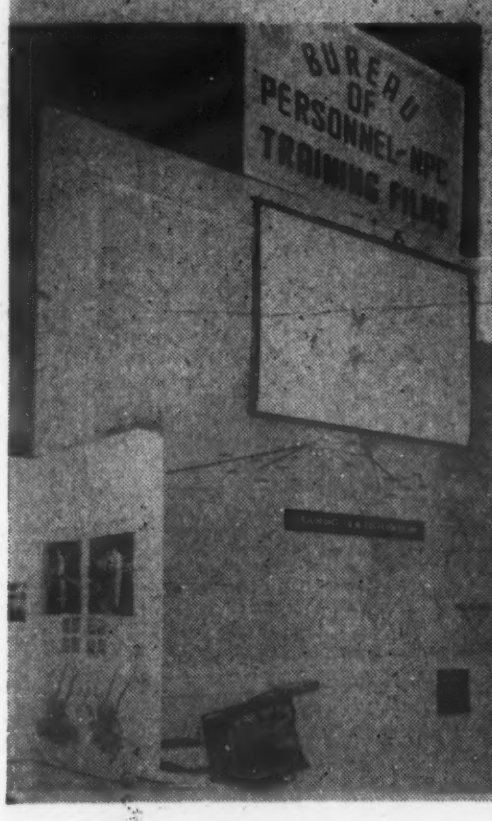


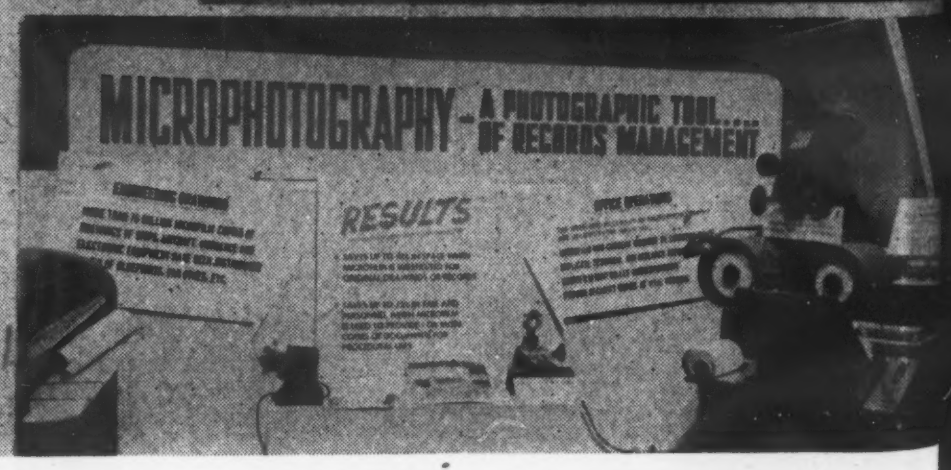




NAVAL PHOTOGRAPHY EXHIBI T

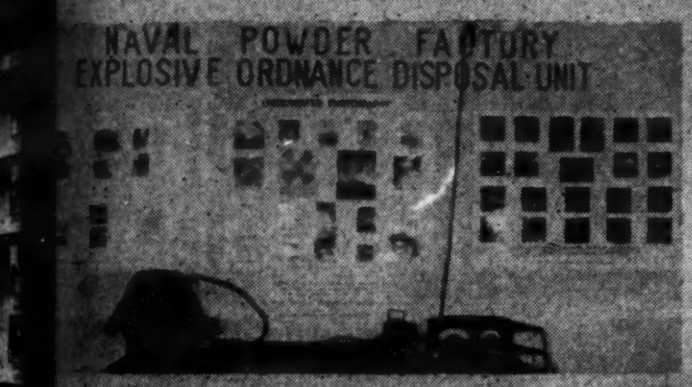
Photography exhibits at the Naval Air Station. Here were shown the greatly varied uses of photography in the Navy, and the array of equipments required for photography's application to many phases of Navy operation. The display, center, right, was flown in especially for the AFCA show by the Navy School of Photography, Pensacola, Florida.

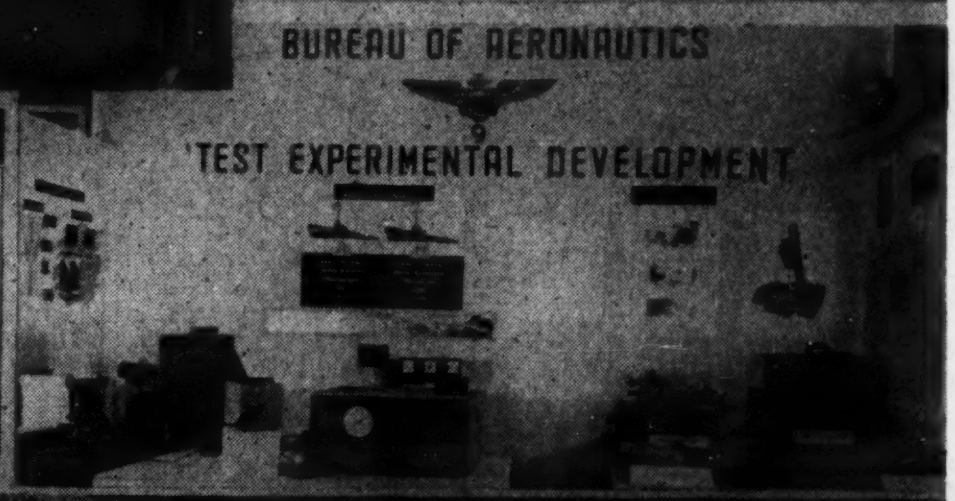




THE NAVAL AIR STATION

Of prominent interest in the Navy photography display were the cartographic cameras used by Navy Long-Range Photo Reconnaissance Units, and the charting process demonstration wherein photos taken by the Recon unit were used to compile charts.

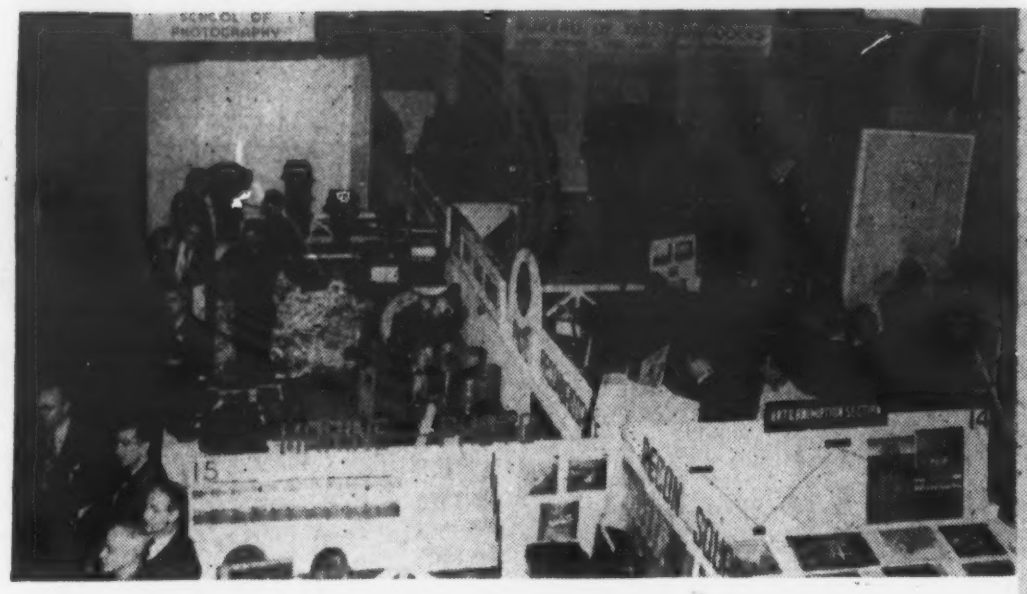




NAVAL PHOTOGRAPHIC CENTER

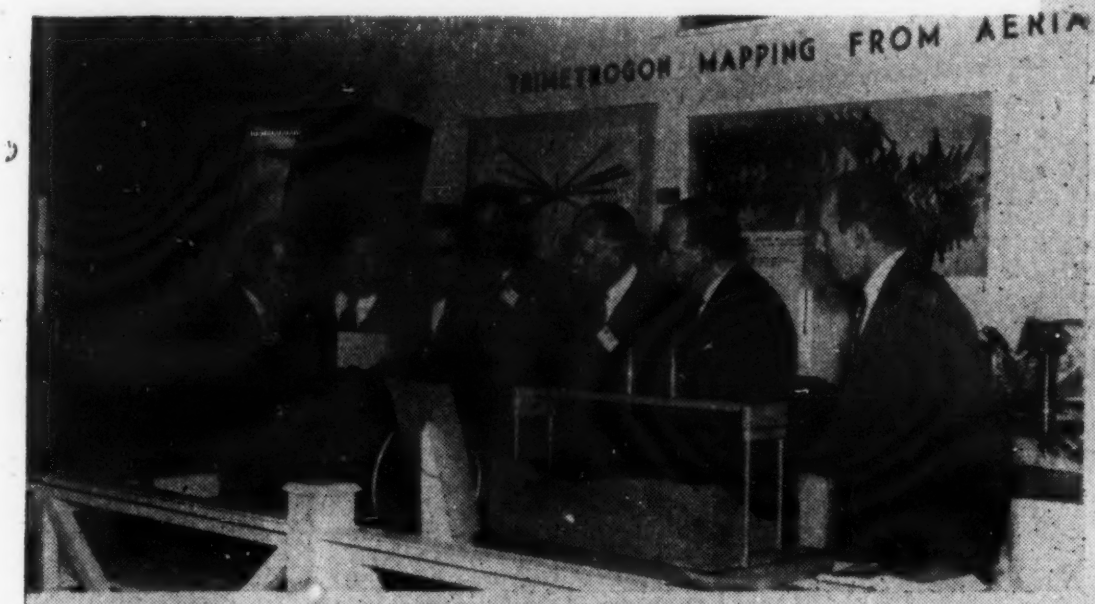
U.S.N.A.S.
Anacostia, D. C.

THE AFCA VISITORS ARRIVE AND LOOK IT OVER



Below: Being shown the photo charting process are Rear Adm. E. E. Stone, Naval Communications Chief; Maj. Gen. F. H. Lanahan, Jr., CG of Fort Monmouth; Brig. Gen. S. H. Sherrill, AFCA Exec. Dir.; and Fred Lack, AFCA President-elect.

Photographic exhibits at the Naval Air Station, and electronics at the Naval Research Laboratory.



Above left (at right in photo): Rear Adm. J. R. Redman, Western Union Telegraph V.P., and G. W. Bailey of I.R.E. and ARRL. Center: L. H. Peebles of the NSRB. Partially shown are T. S. Gary and Brig. Gen. W. T. Guest. Directly below: Adm. Stone and Gen. Lanahan. Right: Mr. Lack at the controls.

AFCA 1949

CONVENTION

WASHINGTON, D. C.

In the third national convening of the Armed Forces Communications Association, March 28-29 at Washington, D. C., a milestone was reached in the association's history. With the announcement made at the meeting of the election of new officials to take office at midyear, there passed the era of the original "founding father" officers. The first change in the designated leadership of the AFCA since its beginning will take place July 1st. Western Electric Vice President Fred Lack succeeds President David Sarnoff.

There is more than the historical highlight of a "first" in the change. A good augury for the association's future is clearly indicated, for the character of the incoming president implies the continuance of strong AFCA leadership. The Sarnoff spirit of adventure for the future had taken hold of the association in its infancy. The drive of Fred Lack gives promise of its progressive growth toward maturity.

On the military side of the AFCA's interests there was another "first" in the Washington meeting. The Navy sponsorship of this meeting rounded out national convention sponsorship by all three of the major armed services. The Signal Corps had been the host service for the first national meeting, the Air Force for the second. So there was demonstrated, with this meeting, full participation by all the services in the association's activities; and at the same time there was demonstrated again the smooth cooperation of the communications branches.

The communications services of the armed forces have always shown that they knew what unification meant—they have made it work, and have done it easily. Nowhere has that fact been better exemplified than in the work of these services in the activities of the AFCA. The Navy show this year added the latest emphasis to that actuality.

Navy Praised for Work as Host to AFCA Convention*

Highest praise has gone to Rear Admiral Earl E. Stone, Chief of Naval Communications, and his staff, particularly Captain Robert J. Foley, for the excellent arrangements at the Armed Forces Communications Association annual convention in Washington. Brigadier General David Sarnoff, Board Chairman of the Radio Corporation of America, wrote a letter commending the Navy's arrangements to Admiral Louis E. Denfeld, Chief of Naval Operations.

Other letters of praise for the Navy's handling of the convention in its role as host service came to Admiral Stone from the new AFCA President Fred Lack, Vice President of the Western Electric Company in charge of the radio division; Theodore S. Gary, Vice President of the Automatic Electric Company; Major General F. H. Lanahan, Jr., commanding general of the Fort Monmouth, N. J. Signal Center; Colonel Paul L. Neal, commander of the Signal Corps Engineering Laboratories; and William Mansfield, Assistant Vice President of the Southern Bell Telephone & Telegraph Company.

**From TELECOMMUNICATIONS REPORTS.*

Navy Prepares Fine Show

Close to 500 members came to Washington for the 1949 meeting, enjoying a thoroughly successful affair from start to finish. Even the weather favored the convention, the second day being near perfect for the round of visits to the Navy host's excellent display of communications—electronics and photographic equipment. A considerable portion of the viewing of exhibits took place outdoors, and the state of the weather played an important part in the showing of Navy ships and equipment.

The Navy was probably prepared for all contingencies, however. Certainly all observable arrangements had been thoroughly made to every slightest detail. The Navy's performance as host to the AFCA was remarkable. Letters attesting to that have poured into the Navy Department from industrial and service leaders who attended the meeting. The praise has been lavish, and the Navy deserves it. Their displays were extensive, and much care had obviously been put into the preparation of them for that second day showing.

On the first day of the convention, during business, luncheon, and banquet meetings, the visiting association members heard views on the AFCA's sphere of interests from leaders in the field—industrial and military. Especially important addresses were delivered by retiring AFCA President Sarnoff, Federal Communications Commission Chairman Wayne Coy, and the National Security Resources Board's Assistant Director of Production Leighton H. Peebles. Their comments at the meeting received nationwide attention from the press, being given, for example, prominent front page space by the *New York Times*.

Others heard during the first day meetings were AFCA President-elect Fred Lack; Dwight R. G. Palmer, President of the General Cable Corporation, who was toastmaster at the evening banquet; Vice Admiral John Dale Price, Deputy Chief of Naval Operations for Air, and recently

Two "firsts" in AFCA's history at third national meeting—
First change of officers since association's beginning.
First round of services' convention sponsorship completed.

nominated for Vice Chief of Naval Operations; Brigadier General Stephen H. Sherrill, Executive Director of the Armed Forces Communications Association; Rear Admiral Earl E. Stone, Chief of Naval Communications; Major General Spencer B. Akin, Chief Signal Officer; Major General Francis L. Ankenbrandt, Director of Air Force Communications; Captain Robert J. Foley, Navy Coordinator with the Joint Communications - Electronics Committee; and Captain A. A. Burke, USN.

Electronics Estimate

Speaking at the afternoon session Mr. Peebles, wartime chief of the War Production Board's Communications Division, drew the interest of the assembled AFCA members with his statement that "some experts have estimated that, in any future war, *20% of the cost of production will be for electronics equipment.*"

Mr. Peebles emphasized the important role of the National Security Resources Board in mobilization planning and that "effective mobilization can only be accomplished by cooperative action of government and industry."

Sarnoff Final Address

At the evening banquet General Sarnoff, in his final appearance as AFCA president, made a strong appeal to United States industry to "make company and personal sacrifices to aid the preparedness planners." The interest and experience of the best brains in American industry is needed, he said, to work with our military planners.

Recalling his prediction at last year's AFCA meeting in Dayton that television would ultimately be used to aid in the direction of battles, the retiring AFCA president pointed out that the possibility of such use of video has since been demonstrated. This was in reference to the first ship-to-shore telecast which covered a mock air attack from a Navy carrier off New York. The strategic importance of television in military operations was thus revealed dramatically, said General Sarnoff. He offered the speculation that, "the victory, in another struggle, could well go to the side which sees farther sooner."

In concluding, General Sarnoff paid tribute to General (Harry C.) Ingles "through whose vision this association was conceived, and through whose encouragement it has steadily advanced." He congratulated the members on the election of Mr. Lack, and also expressed appreciation for the work of AFCA Executive Director, General S. H. Sherrill, saying, "He has done a magnificent job in coordinating and in extending our membership. The splendid magazine SIGNALS is evidence in print of the success of General Sherrill and his staff. As retiring president, I thank them for their excellent cooperation and congratulate them upon the fine progress which they have achieved."

General Sarnoff closed his address by pledging "anew to our Country, and to all services of the armed forces, the wholehearted cooperation of the industry and its workers towards helping to secure the blessings of peace for our Nation and for freedom-loving peoples everywhere."

Address by the Toastmaster
Dwight R. G. Palmer,
President, General Cable Corporation

On behalf of your president, your other officers and on my own, I welcome you to this, our third annual dinner.

Since we last were together there have been developments of world-wide importance. These are inter-related—you cannot segregate them!

The forces of world totalitarianism have been on the move. By a variety of maneuvers designed to weaken the abilities of free peoples to resist any aggressive onslaught, these forces work night and day to undermine the freedoms of all democratic nations.

At last however, the democratic nations have awakened to the danger. They have finally evaluated what has been happening and, having determined to do something about it before it is too late, have given birth to the North Atlantic Pact, now in the stage of adoption. The North Atlantic Pact is News—Big News!

Its aim is to serve notice that the free peoples united, will immediately bear down on any aggressor who touches the soil of a common, delineated boundary.

By this agreement the signatories will serve notice that they are vigilant and awake: That they are prepared for any emergency, at the same time harboring no aggressive design of their own. The Pact, a Senator happily described as—the "greatest war deterrent ever devised".

The Armed Forces Communications Association have a vital interest in this dramatic development—the onslaught of Totalitarianism and the girding to resist it! Born out of the experiences of the last war, this organization has been in the vanguard of those urging the maintenance of our national security. It has served to carry forward into the so-called peacetime era the liaison between a large segment of industry and the military. Sincerely we have striven to serve as a "patriotic educational and non-profit society of Americans dedicated to military, scientific and industrial preparedness as a strong guarantee of national security". For we have realized that only by keeping America strong can we avoid the provocations of war.

All who seek to preserve freedom realize the important part that free communications play in the progress of such a giant undertaking as the North Atlantic Pact, and mind you it was the free exchange of ideas and communication which brought about the Pact. It is only fitting that we who are engaged in the field of communications should be alert to the impending trends. For the forces that oppose our free way of life are precisely those that have utilized the severance of free communication as the first step in their program of totalitarian control.

As citizens in a democracy, we know that security is a cooperative venture. We believe that all men of good will, men of science and men of industry, working in harmony with our great military leaders, can make an indispensable contribution towards our national defense, our economic freedom, the brotherhood of man and the preservation of liberty throughout the world.

The world knows that the United States has joined with all freedom-loving countries of the world to utilize the United Nations and other instruments for perpetuating world peace. Communication plays its role in peace as it did in war, as one of the vital agencies of national policy. In proclaiming our unequivocal intentions we have utilized all the media of free communication to make our purpose direct, forthright and clear. In doing this, in telling the world what we are doing, in posting this warning, we are not inviting war—we are advancing, not hindering, the cause of real peace.

Wayne Coy Praises AFCA

Addressing the luncheon session of the convention's first day, Wayne Coy commended the purposes and work of the AFCA and reviewed the work of the Federal Communications Commission in relation to national defense.

Reporting on the status of U. S. Communications, the FCC chairman stated that interstate and international communications facilities are now substantially improved for the purpose of national defense, as well as for other purposes, over what they were at the beginning of World War II. Mr. Coy was highly praiseful of mobile radio (as distinguished from common carrier mobile radio systems) as "potentially one of our most powerful instruments of national defense."

(*Continued on page* 21)

At the banquet, L to R: D. R. G. Palmer, Toastmaster; Brig. Gen. David Sarnoff; and Vice Adm. J. D. Price, USN. Below: Mr. Palmer delivers opening address. At his left are Maj. Gen. S. B. Akin and L. H. Peebles.

Below: Admiral Price and retiring AFCA President Sarnoff deliver principal addresses at evening banquet.

Below, at the first day luncheon, L to R: Newly elected AFCA President Fred Lack; Chief Signal Officer, Maj. Gen. S. B. Akin; former Senator Wallace H. White, of Maine; and Capt. A. A. Burke, USN.

Below, at the afternoon symposium, L to R: L. H. Peebles of the NSRB; Rear Adm. E. E. Stone, Naval Communications Chief; Maj. Gen. F. L. Ankenbrandt, Air Force Communications Chief. In background, AFCA Counsel F. W. Wozencraft.

Below, L to R: F. G. Macarow, AFCA Washington Chapter pres., and luncheon meeting toastmaster; Wayne Coy, FCC Chairman; and Rear Adm. E. E. Stone, USN.

Above, L to R: Maj. Gen. H. C. Ingles, RCA V.P.; Maj. Gen. H. M. McClelland, MATS Deputy Chief; Brig. Gen. S. H. Sherrill, AFCA Exec. Dir.

Address of
Brig. Gen. David Sarnoff at
Third Annual Meeting of the AFCA
March 28, 1949
Shoreham Hotel, Washington, D. C.

As president of the Armed Forces Communications Association, I appreciate this opportunity to extend the greetings of our Association to the officers, enlisted personnel and civilian employees in the communications and photography services of the Armed Forces. This year it is our privilege to be the guests of the Navy, which for so many years has pioneered so well and contributed so much to communications and all its allied services. We are deeply grateful to the Navy for its efforts to help make our meeting, this year, a memorable one.

Last month during a visit to England, it was my privilege to dine and spend an evening privately with Mr. Winston Churchill, for whom I in common with many others have great admiration. It pleased me, as a communications man, to learn that he has an intimate understanding of the part communications must play in modern military action. In his memoirs now being published, he goes out of his way to emphasize the importance of communications, especially in the Battle of Britain. In describing the German air attack on England in August and September, 1940, he says: "If the enemy had persisted in heavy attacks and damaged the telephone communications, the whole intricate organization of Fighter Command might have broken down. This would have meant not merely the maltreatment of England, but the loss to us of the perfected control of our own air in the decisive area." And again he says: "All the ascendancy of the Hurricanes and Spitfires would have been fruitless but for the system of communications built before the War."

Mr. Churchill, as you know, is a keen student of military history, and much of his brilliance as a leader in World War II came from his studies and his appreciation of the lessons that he learned. In such a study of the decisive factors in many important battles, one finds it strikingly significant that the means of communication available to the commanders and the use they made of their communication facilities often decided not only the outcome of the battle, but frequently established the strategy and tactics of the day.

In World War II, communications were the key to the success of our advance in Europe, from the time of the landings on D-Day until the final victory was won. This I know as do many of you here, from personal observation. And we all know that communications played an equally important part in the Pacific war.

I have mentioned the significance of the availability of communications facilities as well as their effective use. The Armed Forces, I know, will take care of the latter. It is our job in industry, I think, to do all we can to assure that such advances as we make in the communications art are promptly made available to the appropriate military service. That is certainly one of the principal purposes of our Association and the reason so many firms and individuals are members.

Last year, at our meeting at Wright Field, I emphasized that if we ignore the swift advances of science we court disaster, and I mentioned the probable use of television as an aid to victory in battle. Since then it has been demonstrated by the aircraft carrier, "Leyte," at sea off New York City, how television can be used to direct tomorrow's battles. In this first ship-to-shore telecast in history, an estimated two million viewers in the East, including high-ranking Naval personnel in Washington, D. C., watched the flat-top some 200 miles away undergo a mock attack by its own planes in maneuvers known as "Task Force TV."

The Navy noted officially that the unrehearsed action, from the briefing of pilots to the return of the planes to the ship, was presented with a smoothness and technical perfection which made the experimental nature of the telecast all the more impressive and significant. The strategic importance of television in naval, military and air operations in this modern age was thus revealed most dramatically. The event was declared by the Navy to be "a milestone of technical achievement and patriotic service to the Navy and the citizens whom it serves."

Far-sightedness takes on a different meaning in the great complexities of modern war, with supersonic speeds, guided missiles, and the danger of "surprise attack." It used to be said that the battle goes to those who get there "fustest" with the "mostest." The victory, in another struggle, could well go to the side which sees farther, sooner.

In the expanding horizon which the electronic arts have brought to communications, there is the additional satisfaction to those of us in industry that we are adding to the structure of communications as a weapon of national defense. By these developments a vast service to the home, to express by sound, sight, and eventually color, the fullest information, the best thought of our time, and our educational purposes. In a larger sense than we may realize, we are helping by this means to build an instrument not only of war preparedness but of peacetime living for the future. For better communications will make us stronger both in peace and in war.

And while on the subject of peace and war, my recent visit to Europe convinced me more than ever of the need for the Marshall Plan and the North Atlantic security pact. These may not prove to be solutions in themselves, but together they offer hope and encouragement to the peoples of Western Europe, a fact which amply justifies their existence. Morover, through the combined operations of the two projects we are enabled to gain the time so sorely needed to work out the complicated problems which are astir in a world that is neither at war nor at peace. Time also is required to gear our industry toward a mobilization plan that would be effective in the event that an emergency cannot be avoided—effective without confusion and without delay. But actually we need more than time, if we are to be fully prepared to meet successfully a possible emergency of modern dimensions. We need, also, the interest and experience of the best brains in American research laboratories and in industry to work with our military planners.

I cannot emphasize too strongly that all the large corporations and small businesses, together with their best men, must make company and personal sacrifices to come to the aid of the preparedness planners.

This is my final appearance as president of your Association. I congratulate you upon the selection of Mr. Fred Lack as your next president, for as a veteran in the field of communications he has shown keen interest in this organization since its inception. I know that the Association will continue to move forward in the achievement of its objectives under his able leadership.

It is most fitting at this time again to express our sincere appreciation to General Harry C. Ingles through whose vision this Association was conceived and through whose encouragement it has steadily advanced. He realized the vital role that such an organization could play in our national security. The success of our efforts in following toward the goals he pointed out reveals that he has charted for us an important course in the interests of the Nation.

And it is with grateful appreciation that we salute General S. H. Sherrill and his highly efficient staff. As Executive Secretary of the Association since its formation, he has done a magnificent job in coordinating and in extending our membership. The splendid magazine "Signals" is evidence in print of the success of General Sherrill and his staff. As retiring president, I thank them for their excellent cooperation and congratulate them upon the fine progress which they have achieved.

We pledge anew to our Country, and to all services of the Armed Forces, the whole-hearted cooperation of the industry and its workers towards helping to secure the blessings of peace for our own Nation and for freedom-loving peoples everywhere.

AFCA group is greeted at Naval Research Laboratory. L to R: Wallace R. Fingal, managing editor, SIGNALS; Brig. Gen. Ivan L. Farman, Deputy Director of Air Force Communications; Theodore S. Gary, Vice President, Automatic Electric Company, and AFCA Vice President for Chapters; Leighton H. Peebles, Assistant Director of Production, National Security Resources Board; Brig. Gen. Wesley T. Guest, Chief, Army Communications Service Division of the Signal Corps; Brig. Gen. Stephen H. Sherrill, AFCA Executive Director; Fred Lack, Vice President, Western Electric Company, and President-elect of the AFCA; Capt. F. R. Furth, USN, Director of the Naval Research Laboratory; Rear Adm. Earl E. Stone, USN, Chief of Naval Communications and Comdr. E. J. Fahy, USN, Director of Electronics, Ship and Amphibious Division, Bureau of Ships. Comdr. Fahy had charge of the exhibits construction for the AFCA show at the Naval Research Laboratory, and is seen here with Capt. Furth extending the welcome on behalf of the Laboratory.

Half-million Mobiles Seen

Two-way radio has been authorized for some 200,000 vehicles, Mr. Coy said, and in five years it is expected that a half-million vehicles will be radio-equipped. "It is a type of equipment," he stated, "that should be of inestimable value in mass evacuations, in rushing aid to the injured, in fighting fires, in repairing damage to our utilities, in combatting sabotage — in scores of other emergencies."

In commenting on the improvement of common carrier facilities in the U. S. the FCC Chairman noted the following advances:

"There are today 38,000,000 telephones in the United States. That is 40 percent more than we had before Pearl Harbor. More telephones have been installed since the war than were installed in the 20 years before the war.

"Some 7000 vehicles are now equipped with radiotelephone enabling the occupant to talk via the regular telephone switchboards with any phone in the nation.

"Fourteen trains are now equipped with phone service for the convenience of their passengers. Eleven thousand vessels and 150 airplanes now have radio-telephones for public use.

"The Bell System is engaged in a five billion dollar construction program. This program is giving us far more alternate routes and many more miles of underground circuits than we had before the war."

In praise of the AFCA Mr. Coy said, "In the light of my experience I can assure you that your work of promoting liaison between industry and the armed forces and between the three services, and of preserving and fostering the spirit of fellowship among former and future communications personnel of the services is a most valuable contribution to our nation security.'

Standardizing Emphasized

Mr. Coy, Mr. Peebles, and Mr. Lack, in their appearances on the speakers' platform, all stressed the need for standardization of radio parts. Said Mr. Peebles:

"Much attention (in The National Security Resources Board) is being given to the question of standardization and interchangeability of parts for it is through standardization that production problems can be simplified and quantity production achieved. Take such a simple thing as the standardization of the teletypewriter keyboard. In World War II, because of lack of standardization, interchange of messages among services was much delayed. Since that time there has been much progress toward standardization of these keyboards but complete agreement has not yet been reached. It is important that agreement should be reached. Also, if we could standardize on the 24-hour clock it would tend to prevent much confusion as to dating. There is much yet to be done in the standardization of component parts. This work is going on but should be speeded up."

In something of the same vein, Mr. Coy stated, "I believe that one of the most hopeful possibilities of cooperation between the military and industry is the movement toward standardization of radio equipments, particularly as to components. In the past this lack of standardization has been costly and time-consuming in con-

verting to war and in reconverting to civilian production. Wherever it is feasible and appropriate for the FCC to assist in this effort in any way, as for example, by incorporating changed specifications in its rules of good engineering practice, we are happy to do so. We invite more consultation with the military and industry on this subject."

The need for standardization of parts was given especial emphasis in the address of AFCA President-elect Fred Lack. The Western Electric Company vice president has had much experience in standardization efforts, having headed the American Standards Association for two years. In his address to the AFCA members at the afternoon meeting he urged that industry assist in the standardization program to aid the military services, and pointed out that the program was of value also for civilian production.

Following the evening banquet, which had been given an impressive pomp and circumstance opening by the crack Marine drum and bugles corps, and furnished with dinner music by the Navy orchestra and a Wave vocalist, the AFCA members heard an address by Vice Admiral John Dale Price. The Deputy Chief of Naval Operations (since nominated for Vice CNO) commented on the future of the Navy, stressing the need for adequate communications, no matter what shape a future Navy may take.

Annual Report Shows Improved Financial Status

The annual report of the AFCA was presented by General Sherrill in opening the afternoon session of the first day. The association's executive director pointed out that since the AFCA business year does not terminate until May 1st the report was not a final one for the year. The report in its then present status, he said, indicated an improved financial position for the association over that of a year ago. This was chiefly due, General Sherrill stated, to more efficient operation, a slight increase in advertising income, increased subscriptions to libraries, etc., and an increase in group membership. An increase of $5000 in assets for the year, he said, is indicated.

General Sherrill announced the results of the election of officers and directors being as follows:

President:

Fred R. Lack

1st Vice President:

Theodore S. Gary

Address by Wayne Coy, Chairman
Federal Communications Commission
Before the Annual Meeting of the AFCA
Shoreham Hotel, Washington, D. C.
March 28, 1949

These are days when even the most sedentary of us can thrill to the doubtful pleasure of living dangerously.

We snap on our radio or pick up our paper and get up-to-the-minute reports on the latest incident that threatens to lead to an international crisis, that threatens to plunge the world into a war, that threatens extermination of the human race.

When we hobble home in the evening after an exhausting day of trying to earn a living, we can relax by learning about the many and diversified methods being developed for our untimely demise. We can entertain ourselves by trying to decide by which method we would least like to be done in—provided we had a choice. The variety is so wide, so grim, so fully packed with doom—radio-logical warfare with atom bombs, nuclear emanations, gamma rays, neutrons, beta particles, alpha particles, ionizing radiations, radioactive contamination; gas bombs with blood and nerve poison gasses and blister gasses; biological warfare with bacteriological bombs, epidemic and non-epidemic diseases, germ capsules and botulinus toxins; incendiary bombs, super-explosives, supersonic guided missiles, stratosphere rockets and death rays.

Every man to his taste. I don't mind living dangerously provided the danger is both minute and remote. I do not care at all about living as dangerously as the conditions of modern warfare dictate.

Therefore, when I tell you that I am glad to note the progress of such an organization as yours, you can be sure that it comes from my heart. I am not an expert on the instruments of mass destruction, but I do believe I know something about governmental organization, about mobilizing our resources for war and about people. In the light of my experience, I can assure you that your work of promoting liaison between industry and the armed forces and between the three services, and of preserving and fostering the spirit of fellowship among former and future communications personnel of the services is a most valuable contribution to our national security.

You, as well as any other group of citizens, have a right to question the FCC on the status of our communications services in relation to national defense. When Congress created the FCC, it stated that it was to "regulate interstate and foreign commerce in communication by wire and radio so as to make available so far as possible to all the people of the United States a rapid, efficient, nationwide, and worldwide wire and radio communication service with adequate facilities at reasonable charges, for the purpose (and it named this first of all)—for the purpose—of the national defense. . . ."

I am glad to be able to report to you this noon that our interstate and international communications facilities are today substantially improved for the purpose of national defense as well as other purposes over what they were at the beginning of the Second World War.

I will report first on our common carrier facilities.

There are today 38,000,000 telephones in the United States. That is 40 percent more than we had before Pearl Harbor. More telephones have been installed since the war than were installed in the 20 years before the war.

Some 7,000 vehicles ae now equipped with radiotelephone enabling the occupant to talk via the regular telephone switchboards with any other phone in the nation.

Fourteen trains are now equipped with phone service for the convenience of their passengers. Eleven thousand vessels and 150 airplanes now have radio-telephones for public use.

The Bell System is engaged in a five billion dollar construction program. This program is giving us far more alternate routes and many more miles of underground circuits than we had before the war.

Despite an unprecedented expansion in telephone facilities, the Bell System has more than a million persons on its waiting list for new telephones and two and a half million who want improved facilities.

Besides the Bell System and 6,200 independent companies, this nation is served by between 30,000 and 40,000 mutual, cooperative or farmer-owned lines and systems. Most of the latter are make-shift arrangements with no switchboard or central offices of their own.

A report issued two weeks ago by the Agriculture Committee of the House of Representatives reveals that our farm telephone service is the weakest link in our telephone facilities. This report was issued in connection with a bill to amend the Rural Electrification Act to make loans for the expansion and improvement of rural telephone service.

According to this report there are very few more farms with telephones today than there were back in 1920—a whole generation ago. This is in sharp contrast to the progress in the nation as a whole where the number of telephones tripled. The lowest point in farm service was reached in 1940 when 75 percent of the farms had no phones. Considerable progress has been made since then, but today almost 60 percent of American farms are still without telephones. But that is not the whole story. This report states that much of the service that does exist is inadequate, that many of the rural lines are so antiquated and decrepit that the instruments attached to them are virtually useless.

When we consider how essential farm telephone service is in expediting food production and in various civilian defense measures during a war, we can realize what a gap this constitutes in our communications preparedness

(Continued on next page)

WAYNE COY

(*Continued from preceding page*)

A word about our telegraph system.

While telephone and air mail traffic have gone up sharply since the war, telegraph business has declined. Despite sizable general rate increases since the end of the war, Western Union is operating at a substantial loss. In many places service has been curtailed. In an effort to improve its position, Western Union is engaged in a 72 million dollar modernization program. Its wire plant is being replaced by wire circuits leased from the Bell System and by microwave radio relay systems. Automatic reperforator switching facilities are being installed.

Telefax units and telecars are coming into use. This is an attack on the weakest link in our telegraph service—the pick-up and delivery of telegrams.

Now I would like to discuss for a moment a means of communication that is potentially one of our most powerful instruments of national defense.

It is a type of communication that should be of inestimable value in mass evacuations, in rushing aid to the injured, in fighting fires, in repairing damage to our utilities, in combatting sabotage—in scores of other emergencies.

I refer to our private mobile radio systems as distinguished from the common carrier mobile radio systems. The police blazed the trail for this type of service before the war. At that time they had 1600 land stations and 15,000 mobile units. Today they have 4000 land stations and 50,000 mobile units in service or scheduled to be constructed. We now have regional and nationwide police networks to coordinate efforts on a far-flung scale.

I would like to call your attention especially to the unprecedented progress that has been made since VJ-Day in developing other classes of mobile communication. We now have in service or authorized for construction a grand total of 265,000 land stations and mobile transmitters—five times as many as before the war.

Already 100 cities have radio systems in service or scheduled for construction for their fire departments.

Railroad operations that play such a vital role in troop movements and war production are now being speeded by radio—especially in the time-consuming job of classifying freight in the switching yards.

Our inter-city buslines are moving rapidly towards coast-to-coast communications systems. Inter-city trucklines are also turning to radio. This means that these buses and trucks could be quickly mobilized and dispatched to any part of the nation where a catastrophe might occur. The 32,000 radio-equipped taxicabs would be another source of rolling stock susceptible of being directed at the will of civil or military authorities.

Damages to water and gas mains and to electric and telephone lines in many American cities are being repaired faster than ever before through the use of radio-equipped crews. More than 26,000 utility trucks are now so equipped or scheduled to be equipped.

The petroleum industry employs walkie-talkies, radio-equipped trucks and even radio-equipped airplanes to patrol its pipelines and to dispatch crews in case of a leak or an explosion.

The ability of these radio mobile units to rush aid to a stricken area has been amply demonstrated in such recent cases as the Texas City disaster, the Columbia River flood and the western snow storms.

In all, we have authorized two-way radio for some 200,000 vehicles. In five years from now I expect to see half a million vehicles radio-equipped to serve their country in war or peace.

Amateur radio, which has served the nation so well in past disasters and has been such an effective training school for military and industry personnel, is growing steadily. We now have 78,000—an increase of 18,000 since the war.

The services of broadcasting in World War II are too well-known to need elaboration here. Broadcasting played a stellar role in rallying the home-front for such measures as rationing, bond sales, civilian defense, plasma collection, salvage drives, manpower recruitment. Today our standard system of broadcasting has been more than doubled with many more stations still being built.

In addition, we have two new systems of broadcasting.

We have 700 FM stations on the air and 240 under construction.

We have 60 television stations in operation, 65 under construction. In the next six or seven years we probably will have 800 to 1000 television stations. The six television stations on the air during the war demonstrated that medium's unique power to instruct civilians in various civilian defense measures.

No nation in history has ever been so well equipped with civilian communication facilities—facilities to promote our efficiency, comfort and enjoyment in peace and our national security in event of attack.

Our very profusion of radio transmitters can also become a source of danger in wartime. The spy and the saboteur employ this lightning communication wherever possible. As thousands of additional transmitters go into operation each year, the task of patrolling the ether becomes increasingly difficult. It becomes more difficult to check the authorized stations to determine that they are keeping on their assigned frequency and are not being used for espionage, subversive or sabotage transmissions. It becomes more difficult to spot the clandestine transmitters. The havoc created by interference from stations off their frequency or by industrial and medical radio heating devices is magnified.

(*Continued on next page*)

2nd Vice President:
T. J. Hargrave

3rd Vice President:
Rear Adm. Earl E. Stone

4th Vice President:
J. R. Cunningham

5th Vice President:
C. O. Bickelhaupt

Directors:
Walter Evans
Paul Goldsborough
W. G. Eaton

Executive Committee Member at Large:
W. C. Henry

The Navy Exhibits

In the morning of the second day of the meeting the AFCA members were transported by Navy buses from Shoreham Hotel to the various locations of Navy displays. There were three main sites for the exhibitions —the Naval Gun Factory on the Washington side of the Anacostia River, and the Naval Research Laboratory and Naval Air Station across the river in Anacostia, Va.

At the Gun Factory the AFCA members were conducted through the *USS Adirondack* and the submarine *USS Requin* moored in the Anacostia River. Both vessels are equipped principally for communications purposes, and are of recent development. Ships of the Adirondack type, "AGC's," were utilized during the war as flagships in amphibious operations, since they gave fleet and assault force commanders everything that science could provide in the way of communications. The submarine is a radar picket vessel, and this application to submarines is fairly recent. Both vessels contain much in communications-electronics which is of a confidential nature.

The *Adirondack* was a communicator's paradise to the Navy's AFCA guests. It is jam-packed with transmitters, receivers, radar, sonar, and other electronics equipment.

The submarine *Requin* was of intense interest to the AFCA visitors too. Especially remarked was that its antennas must have presented something new in the way of design problems, since there obviously would be unusual strain on the antennas when the submarine is proceeding submerged.

Electronics

At the Naval Research Laboratory a large gymnasium had been excel-

lently set up as an exhibition hall for the display of equipment to the AFCA members. Here the visitors saw exhibits on aircraft television, airborne radar, UHF communications system, voice and teletype, miniaturization developments, sonar display—showing a harbor defense station detecting a submarine entering the harbor, radiophoto activity, radiosonde meteorological equipment, radio detecting and ranging (radar) display, sound beam moving target detector, infra-red signalling device, ultrasonic sound tester, rugged tube developments, the Geiger - Mueller counter, beta-ray bender, electrical micrometer tube, a model plant for isotope separation, special purpose antennas, expendable sono-buoy, radar countermeasures, developments in microwave antennas, the "memory" tube, and various test equipment displays.

Most of the Research Laboratory's exhibits were actually operated for the visitors. Of interest among these was the Navy electronic time division multiplex unit which provides, two, three, or four teletype channels at 60 or 75 words per minute over a single radio circuit; and an UHF voice and teletype communications system in which of particular interest was the dial method of shifting channels, and the new types of shipboard switch panels.

"Submarine" Jeep

An interesting exhibit in action was a special communications equipped deep fording jeep. The laboratory's gymnasium swimming pool was utilized to demonstrate the jeep being driven almost fully submerged. In the deeper end of the pool the water was up to windshield level while the driver made a dozen turns in the water up to his own chest. All operating parts of the jeep are waterproofed, exhaust and manifold intake pipes are extended vertically, putting their open ends well above the jeep.

Gags with Radiac

The Radiac detector was put to use in a demonstration which provided some amusement at the Naval Laboratory during the exhibition day. Radio-active buttons were slipped into the pockets of some of the members, without their being aware of it. As these visitors were leaving the laboratory they were stopped at the door by laboratory personnel with

WAYNE COY

(*Continued from preceding page*)

I think most of you recall that two days after Pearl Harbor the Radio Intelligence Division of the FCC traced the signals of a clandestine transmitter to the German Embassy here in Washington.

During the war the RID located nearly 400 unlicensed transmitters, most of which fortunately did not involve espionage. The uncanny ability of the RID to pounce upon illegal users of radio was so well demonstrated that espionage transmissions from this country were effectively discouraged.

Up to now I have been talking about the techniques of communications in national defense.

In concluding I would like to take a moment to discuss the other element in defense—our mental preparedness. In the preparedness stage before the last war and during the war we heard a lot about "total war" and "all-out effort." Actually, our attempts to achieve that state of mind constituted a tremendous struggle.

All of us here—the military, the civilian agencies, industry—have pressing problems peculiar to our own field. It is an almost unconquerable temptation to keep our sights down within the groove of our own job instead of lifting them up to view the whole broad picture of the design for victory.

And yet our responsibilities toward building our national security can be fulfilled only to the extent that we dedicate ourselves to a high spirit of comradeship in the common effort.

The opportunities to arouse and nourish that spirit of comradeship are at hand today and every day.

They come to us in the relations between the civilian agencies and the military, between the military and industry, between industry and the civilian agencies and between the civilian agencies themselves.

I believe that one of the most hopeful possibilities of cooperation between the military and industry is the movement toward standardization of radio equipments particularly as to components. In the past this lack of standardization has been costly and time-consuming in converting to war and in reconverting to civilian production. Wherever it is feasible and appropriate for the FCC to assist in this effort in any way, as, for example, by incorporating changed specifications in its rules of good engineering practice, we are happy to do so. We invite more consultation on this subject.

Three current activities involving widespread participation in matters affecting our national security come to mind. One is the program of the Communications Division of the National Security Resources Board.

Another is the outstanding example of succesful cooperation set by the Interdepartment Radio Advisory Committee. This Committee is composed of all the government departments concerned in the use of radio. It is charged with the duty of advising the President on matters regarding government frequency allocation and assignments. For more than a quarter of a century this Committee has achieved a record of distinguished achievement in fruitful inter-agency relationship.

The Telecommunications Coordinating Committee is still another example of an organization whose success stems from the mutual efforts of cooperation advanced by its members. As you know, membership of the TCC is composed of government agencies, military and civil, whose interests extend into the regulation or policy aspects of telecommunication.

I firmly believe that despite the most diabolically destructive devices turned out by our laboratories, our capacity to marshal our hearts and minds instantly and completely for the single object of victory and our capacity to work together will always remain America's mightiest weapons of war.

**Address delivered by Leighton H. Peebles,
Assistant Director of Production, National Security Resources Board,
at the afternoon session of the Third Annual Meeting of the AFCA
March 28, 1949, at the Shoreham Hotel, Washington, D. C.**

I have been asked to talk to you concerning the National Security Resources Board and what it is attempting to accomplish for preparedness in communications.

I take it that the word "communications" here is used in its broadest sense and includes not only the ordinary oral and recorded communications but includes radar, sonar and similar developments.

First, I want to speak as to the law which established the National Security Resources Board. The Board was created by the National Security Act of 1947, which also established the National Security Council and the Central Intelligence Agency in Title I, and the National Military Establishment in Title II. The Act States:

"It shall be the function of the Board to advise the President concerning the coordination of military, industrial and civilian mobilization, including—

"(1) policies concerning industrial and civilian mobilization in order to assure the most effective mobilization and maximum utilization of the Nation's manpower in the event of war;

"(2) programs for the effective use in time of war of the Nation's natural and industrial resources for military and civilian needs, for the maintenance and stabilization of the civilian economy to war needs and conditions;

"(3) policies for unifying, in time of war, the activities of Federal

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LEIGHTON H. PEEBLES

(*Continued from preceding page*)

agencies and departments engaged in or concerned with production, procurements, distribution, or transportation of military or civilian supplies, materials, and products;

"(4) the relationship between potential supplies of, and potential requirements for manpower, resources, and productive facilities in time of war;

"(5) policies for establishing adequate reserves of strategic and critical material, and for the conservation of these reserves;

"(6) the strategic relocation of industries, services, government, and economic activities, the continuous operation of which is essential to the Nation's security."

This legislation was written with full realization of disturbing world conditions, that as a country we are no longer immune to attack, and that the President must be constantly informed of economic developments so that the country may at all times be prepared to meet an emergency and defend itself. The Resources Board therefore was made a civilian staff agency of the President with the responsibilities I have outlined, these responsibilities that involve all phases of our national life.

To advise the President, an organization must have information if the advice is to be worthwhile. Therefore, it appears, and this is not a legal interpretation, that the directive to advise the President, which Congress has given to the Board, carries with it the implicit authority to obtain the information upon which proper advice can be based. Such information must be obtained, of course, through processes established by law.

The National Security Resources Board, as a civilian staff agency of the President, functions at the same top level of the Government as the National Security Council, the Bureau of the Budget and the Council of Economic Advisers.

Now, as to what the Board is attempting to accomplish on preparedness in the communications industry—first, those of the staff of the Board assigned to this work are informing themselves through every source available to them just how the industry, from the production and operating side, performed during the last war. These are basic data. Many mistakes were made. These are being searched out and an attempt is being made in our planning to avoid similar mistakes.

To inform ourselves, not alone are we using the record of the last war from the Government standpoint, but we are setting up task committees from industry. These committees are composed of individuals who saw the operation of the industry from the industry side during the last war. We are requesting these committees to come to Washington and sit down with representatives of the Board to explore not only the data available in Government but to search their own minds and records for information which will be of value.

A task committee for the electronic equipment industry has met and made a report. Later on, in cooperation with the Munitions Board, an Industry Advisory Committee was appointed and it has met twice, first on November 16th last, and second on February 16th. At these meetings the report of the task committee was submitted and criticisms and suggestions solicited. At these meetings many other problems of the industry were discussed, such as how can the industry be best mobilized; what information is needed to effect mobilization; and how it can best be obtained. In all of these problems, the National Security Resources Board is working with industry, with the Munitions Board, and, through the Munitions Board, with the services in endeavoring to get the answers.

In the communications operating industry, a task committee met and submitted a report covering domestic telephone and telegraph communications. Later, with the cooperation of the Munitions Board, an Industry Advisory Committee was appointed and the first meeting held on February 18th, at which time the two principal branches of the operating industry, through their chosen representatives, informed this Board and the Munitions Board concerning:

1. **World War II—Situation at the beginning and wartime events.**
2. **Situation at the end of World War II.**
3. **Post-War events and present situation.**
4. **Outlook for the future—Peace or War.**

At this meeting the report of the task committee was presented and discussed.

It is planned later, as time and personnel limitations permit, to explore similarly the international communications industry and the radio broadcasting industry to determine the available facilities and necessary controls in an emergency. We are limited as to staff and our objective is to do the more important things first.

The telephone communications industry has grown since the war at an unprecedented rate. At the end of the war there were some 2½ million orders for service which could not be supplied. Despite the increase of some 8 million telephones since the war, there are still approximately 1¼ million applicants seeking service which cannot be supplied at the present time. New applications for service continue to be filed in large volume. The manufacturers of wire communications equipment have increased their capacity

(*Continued on next page*)

the explanation that the detector showed the presence of some radio-active material on the person of the particular visitor. The gleefulness of the lab personnel in having trapped some of the visitors is shown in photos wherein George Bailey of ARRL and I.R.E., and the Air Force's General Ivan Farman are caught with the radio-active buttons on their persons. (*photos page* 28).

Photographic

At the Naval Air Station the principal exhibit was the photographic display. Here there was exhibited for the first time the Navy developed cartographic camera for cartographic mapping. The camera was a wartime project produced in conjunction with the Fairchild Camera Company. Last year cartographic cameras were employed by long range photographic squadrons in mapping Alaska, Greenland, and Latin America. Over 80,000 square miles of terrain were mapped according to the exacting specifications of the Navy Hydrographic Office and other agencies, such as the Geological Survey Officer of the Department of the Interior.

The Navy School of Photography at Pensacola, Florida, exhibited a large, well conceived display which showed some of the school's activities —camera repair, motion picture school, and ground and aerial photographer's school. This exhibit, standing 9 feet high and 14 feet across, when erected, was conceived by Commander Donald Fraser, skipper of Navy photographic schools, who planned it so that it would all fit into a small twin-engined Beechcraft airplane. It was thus flown from Pensacola to Anacostia especially for the exhibit, and was erected in a matter of one and a half hours.

Charting Demonstration

At the air station there was also an excellent exhibit prepared by the hydrographic office. In this exhibit the visitor was taken through a complete charting process, from original requirements for mapping to the preparation of flight lines and specifications. The indexing of plotting of photographs demonstrated, with the aid of Navy photogrammetric devices, how the charts are compiled from the aerial survey photographs.

A feature of the Bureau of Aeronautics Research and Development photographic section was a trigono-

metric camera mount which was unique in that for the first time it becomes possible to rotate the camera in order to compensate for crab of the airplane due to wind drift on flight line.

Electronic Shutter Tester

Also featured was a special shutter tester—an electronic analyzer which employs two photoelectric cells. This device was developed by the Navy to analyze shutter operation and efficiency, shutter flash synchronization, shutter solenoid delay, diaphragm calibration, and the duration and intensity of flash bulbs and gaseous discharge tubes.

The photographic interpretation center showed a rubber terrain model, samples of interpretation reports and other publications, and several items of specialized interpretation equipment.

On a small portable press a demonstration of the photolithography process was given, and the small press was utilized to make souvenir charts and directories to the display booths.

The Bureau of Ordnance had a large display which included the sensational photos taken with a K-25 camera from a V-2 rocket high over the earth at White Sands, New Mexico.

Outdoors, by the air station's hangars, the visitors viewed photographic airplanes, and were given a demonstration of airplane remote control. In the latter all the controls of an airplane were operated remotely, first from a truck parked by the hangars, and then from an airplane flying nearby.

The first visitors to the air station had been filmed by movie cameras. This film was rapidly processed and was projected continuously for later visitors.

(A copy of this film can be had for chapter showings through AFCA Hq.)

Navy "Oscar" Winner Shown

The convention visitors had been treated to an example of Navy photography on the first day of the meeting when the "Oscar" winning documentary film, The Secret Land, was shown at the Shoreham Hotel. The film was exhibited by Captain Robert S. Quackenbush, Jr. who personally had supervised the photography in the polar expedition depicted.

The film screen at the Shoreham during the afternoon meeting, had

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(Continued from preceding page)

and are still working to the fullest possible extent. The reason for the inability to supply telephone service is not the lack of telephone instruments but the lack of central office equipment and outside plant. In areas where central office equipment and outside plant have been increased, there is little or no difficulty in getting prompt service on application but in other fast growing areas it will be a matter of some months before service can be supplied on demand. The industry fully realizes this situation and no effort is being spared to bring the telephone system up to a point where it can give its prewar standards of service.

Despite the tremendous increase in plant and investment, the telephone plant does not have now the flexibility that existed in 1941 to meet increased service demands which in all probability would be made should another war start in the near future. An industry spokesman at the meeting on February 16th indicated that it would take from two to three or more years to build and install the telephone plant necessary to give the system as a whole the flexibility it formerly had.

Of course, with the increased plant there exist many possibilities by which essential service could be rendered if war should occur suddenly. The burden of shortages would fall upon the so-called non-essential civilian demand.

With respect to the situation in the telegraph industry, we face a somewhat different problem from that existing in 1941. At that time there were two major competing companies. Since then there has been a consolidation and now telegraph service is solely in the hands of the Western Union Telegraph Company. Much has been done to improve the service. Some of this improvement was initiated during the period of World War II by the installation of reperforator switching stations.

Now the industry plans for the installation of automatic reperforator stations which, when finished, would materially speed up the time of service and increase the company's ability to handle a volume of messages far beyond present demand. Estimates supplied to the Board for completion of this changeover to reperforator switching stations indicate that these are now planned to be completed by the end of 1950 so far as the reperforator relay offices are concerned, and the two reperforator terminal offices in New York and Chicago to be completed by the middle of 1951 and 1952, respectively.

When organizing the Communications Division of the National Security Resources Board it was felt necessary that the Board be informed at all times as to technological developments in the communications and electronics industry, for communications and electronics when viewed from all aspects are dynamic fields of endeavor and research and development work pay big dividends.

Some experts have estimated that, in any future war, 20 percent of the cost of production would be for electronics equipment. New ideas, new methods and materials are constantly being brought forth, undergoing development and being applied in service with great success.

Long distance telephone dialing, full automatic telegraph switching, television, far-flung radar systems, and knowledge and guidance of distant moving objects are only a few of the many examples. New components revolutionize designs. The recently announced transistor, an extremely simple device to replace the vacuum tube in many applications, bears witness to this.

The responsibility of NSRB in research and development work is not as clear perhaps as in other fields such as production and critical materials. However, based on the language of the National Security Act of 1947, the Board certainly has the job of acquiring knowledge of research and development effort and planning for the coordination of this effort in the Services, in other governmental agencies, and in private laboratories, in case we mobilize. The Board has a competent staff member who is an associate member of three Research and Development Board committees, viz., Electronics, Guided Missiles and Basic Physical Sciences. Security difficulties have been cleared away and contacts have been established with research and development staffs of other agencies working in this field. Similar contacts have been made with many private laboratories. All of this effort is in preparation for the prime job of giving good advice and making proper recommendations to the President in case of an emergency.

With respect to preparedness, there has been a great deal done by the armed services in measuring the capacity of industries or units of industry to produce. This work is being coordinated with the National Security Resources Board. In many cases an exact knowledge of just what a particular unit of the industry will be expected to produce is not available at the time of survey. Therefore, the present measurements of capacity must necessarily be based upon certain assumptions, such as:

a. That the industrial unit will be producing what it is now producing, or some other end product of an allied nature;

b. That the industry is to obtain all the necessary labor;

c. That it is to obtain all necessary raw material.

All three assumptions are not necessarily correct for, if we have total mobilization, there will be shortages of materials and labor. Moreover, in the electronics industry technological developments occur rapidly. An indus-

(Continued on next page)

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(Continued from preceding page)

trial unit may be called upon to make something very different from that for which its capacity was surveyed.

If all assumed conditions can be worked out in time of an emergency, this measurement of capacity, while an interesting figure, is not useful in planning unless we at the same time know requirements so that requirements and capacity can be equated and, if capacity to produce is found lacking, something can be done about it.

Annex 47, prepared by the Munitions Board, provide for the collection from industrial units of an immense amount of information, all of which must be collated and will form a good background of information for procurement and the distribution of orders, but again, without requirements, the information remains for the time being only interesting. It is part of, but not a mobilization plan.

The recent mobilization plan presented by the Electronics Equipment Industry Advisory Committee suggests a statistical method for the measurement of capacity. This method, I understand, has been used for some years by various industrial units when testing their ability to produce, i.e. square feet of equipped factory space required and number of employees. While being an approximation insofar as its application to any particular unit of an industry is concerned, it does provide a useful over-all guide when examining the industry as a whole. Without requirements, the figure is not of great usefulness when planning mobilization.

It is understood that military agencies have contracted for surveys of productive capacities of certain of the components of electronic end products, following more or less the type of surveys suggested by the Industry Advisory Committee but of somewhat broader scope. This is constructive work and should eventually cover surveys of all electronic components and end products, the result obtained being useful when all requirements are known.

Requirements in the electronic field are difficult to obtain. At present, I understand the Munitions Board is planning to provide a central point at which all electronics requirements of the services will be brought together. This is essential if there is to arise a total figure of requirements against which the capacity to produce can be equated.

In my talk before the Electronics Equipment Industry Advisory Committee on November 16th, I pointed out some of the errors that were made in the last war, among them being the fact that at times different branches of the services were competing on a price basis for the output of certain facilities. This can be prevented by centralized procurement of end items. I understand that today moves are being made towards single-service procurement for all military requirements of certain end products.

Due to the ever-changing technology of the electronic science, it will be extremely difficult for either the Munitions Board or the National Security Resources Board to estimate in advance with any degree of accuracy just what the requirements will be in the event of emergency. The past has seen constant progress in the development of the science of electronics, new applications and new products, all of which have great importance to war and the protection of our country, and have also added to our standard of living. Yet we have, in my opinion, only scratched the surface. Therefore, we can confidently look forward to further progress in this science. This technological progress makes the task of planning for the mobilization of the production of this industry most difficult, for we do not know just what the industry will be called upon to produce in the coming years. The use of electronics in industry and in weapons of war is becoming more and more important and necessary to the carrying out of production and military operations. There have been long steps forward made in guided missiles. They are guided by electronics. This is only one of the many possible future uses which may cause serious impact upon industry.

Much attention is being given to the question of standardization and interchangeability of parts for it is through standardization that production problems can be simplified and quantity production achieved. Take such a simple thing as the standardization of the teletypewriter keyboard. In World War II, because of lack of standardization, interchange of messages among the Services was much delayed. Since that time there has been much progress toward standardization of these keyboards but complete agreement has not yet been reached. It is important that agreement should be reached. Also, if we could standardize on the 24-hour clock it would tend to prevent much confusion as to dating. There is much yet to be done in the standardization of component parts. This work is going on but should be speeded up.

Effective mobilization can only be accomplished by cooperative action of Government and industry. The problems of each should be mutually known and understood and operating procedures adjusted to overcome these problems. Much can be done in simplifying procurement and guiding the placement of orders. In the last war there were many instances where the services were bidding against each other for the product of a facility—and when I say bidding against each other, I mean bidding in dollars. This can be eliminated by single-service procurement and an effort in this direction is being made by the Military Establishment at the present time.

The National Security Resources Board is directed by Congress to advise the President. I would urge every American to become familiar with the mission and with the functions of the National Security Resources Board because of its duty to so prepare our nation that war will become unlikely or, if it should come, that we will be in a position to wage a total and successful war.

also been utilized by the Chief Signal Officer, Maj. Gen. Spencer B. Akin, to show slides illustrating recent developments in Signal Corps equipment. There were shown improvements especially as to miniaturization, winterization, tropicalization, ruggedization and standardization.

General Akin

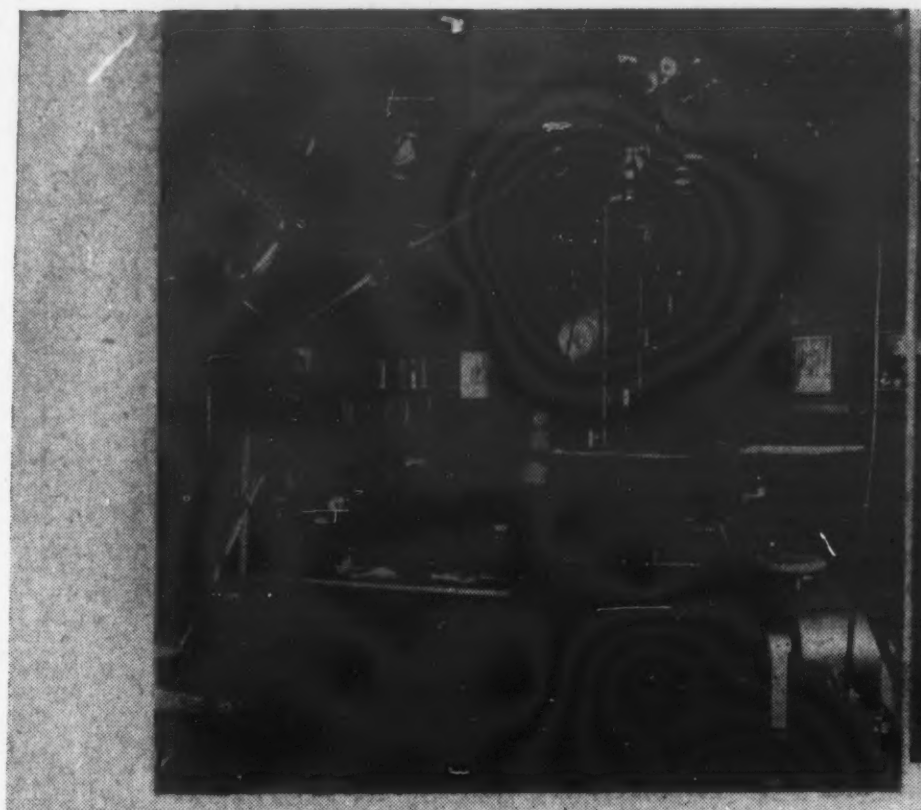
In his address General Akin stated that the AFCA "represents a splendid effort on the part of members of industry, science, and the armed services to work together as a team for national preparedness."

Discussing the planning and engineering of a worldwide telecommunications network the Chief Signal Officer stated that facilities and equipment must be so designed as to "permit the operation of an integrated radio-wire, civil-military telecommunications system if the nation is to meet the requirements of effective defense." The system must have channels capable of handling not only telephone and teletype, but also television, facsimile, radar signals, intercepted radio transmissions of varying characteristics, and possibly Ultrafax. "Systems engineering assumes an importance it has never before been given," he said.

Admiral Stone

Admiral Stone, in his address on the afternoon platform, stressed the importance of communications and electronics in the United States in the nation's security. Fortunately, he said, there exists a great appreciation of this importance among the three services.

The Navy's Communications Chief pointed out that the present intricate electronic communication devices call for highly qualified designers, critical materials, specialized tooling of manufacturing plants, and specialized craftsmen, so that procurement in communications cannot be a last-minute project. He stressed that the armed services depend upon industry for mass production of communication and electronic material, and that advance planning is essential in getting the national defense readied for action. Admiral Stone further pointed out that the military services can maintain in peacetime only the nucleus of a wartime communications system, so that it is of vital importance to have the available facilities operated as a most efficient instrument.



Top left, a movie set at the Navy's photographic exhibit, Naval Air Station, Anacostia. And right, an AFCA group gets into the movies. L. to R: Captain H. J. Dyson, BuAer Photographic Chief; Brig. Gen. Ivan Farman, Deputy Director of Air Force Communications; Brig. Gen. S. H. Sherrill, AFCA Executive Director; Theodore S. Gary, V.P. of Automatic Electric Company, and AFCA V.P. for chapters; Maj. Gen. Francis M Lanahan, Jr., CG of Fort Monmouth; and seated is Rear Adm. Earl E. Stone, Chief of Naval Communications.

Above left: Deep water fording radio jeep. Note that the water is over the hood of the jeep.

Above right: Fun with Radiac. At the Naval Research Laboratory radio-active disks were slipped into the pockets of some of the visitors, and at the Lab's exit Radiac revealed the presence of the radio-active material. In the upper picture George W. Bailey of I.R.E. and ARRL is caught with the disk in his pocket by Comdr. E. J. Fahy who had charge of the Lab displays. In the lower photo Brig. Gen. Ivan Farman is shown also caught "stealing out" with the radio-active disk, this time by Lt. Comdr. Frank Bahry, supervisor of the exhibits construction at the Lab.

General Ankenbrandt

Major General Ankenbrandt, also speaking during the afternoon session, gave emphasis to the regard in which armed forces communications-electronics are now held, by comparing present budgets with those of the pre-war years. In 1935 the Signal Corps had less than $1 million for procurement. Now the new Air Force budget alone calls for $311 million for communications-electronics procurement, research, and maintenance. Of this $90 million is for procurement of new radio and radar equipment for the new aircraft; $115 million for ground radar, including the radar fence installations, and the air traffic and ground control systems; $10 million for leased wire communications; $49 million for modernization of existing equipments; and $31 million for research and developments.

President-elect Lack

The newly-elected AFCA president, Fred Lack, also addressed the members in the first day's afternoon meeting. The AFCA membership, Mr. Lack stated, should employ themselves on missionary work with the public, government officials, and Congress on the needs of the armed services in having adequate communications-electronics devices and equipment, since modern weapons are useless without electronics. Mr. Lack also felt that the AFCA members can stimulate the interest of younger men in joining reserve units of the services, especially in the formation of affiliated units.

Council Meeting

At the morning meeting of the council and national directors, the first event of the convention, the following chapters were represented:

Atlanta
Baltimore
Boston
Chicago
Dallas
Decatur (Ill.)
Ft. Monmouth
San Francisco
Kentucky
Louisiana
New York
Philadelphia
Pittsburgh
Richmond
St. Louis
Washington, D. C.

Action Taken

President Sarnoff presided. The following action was taken:

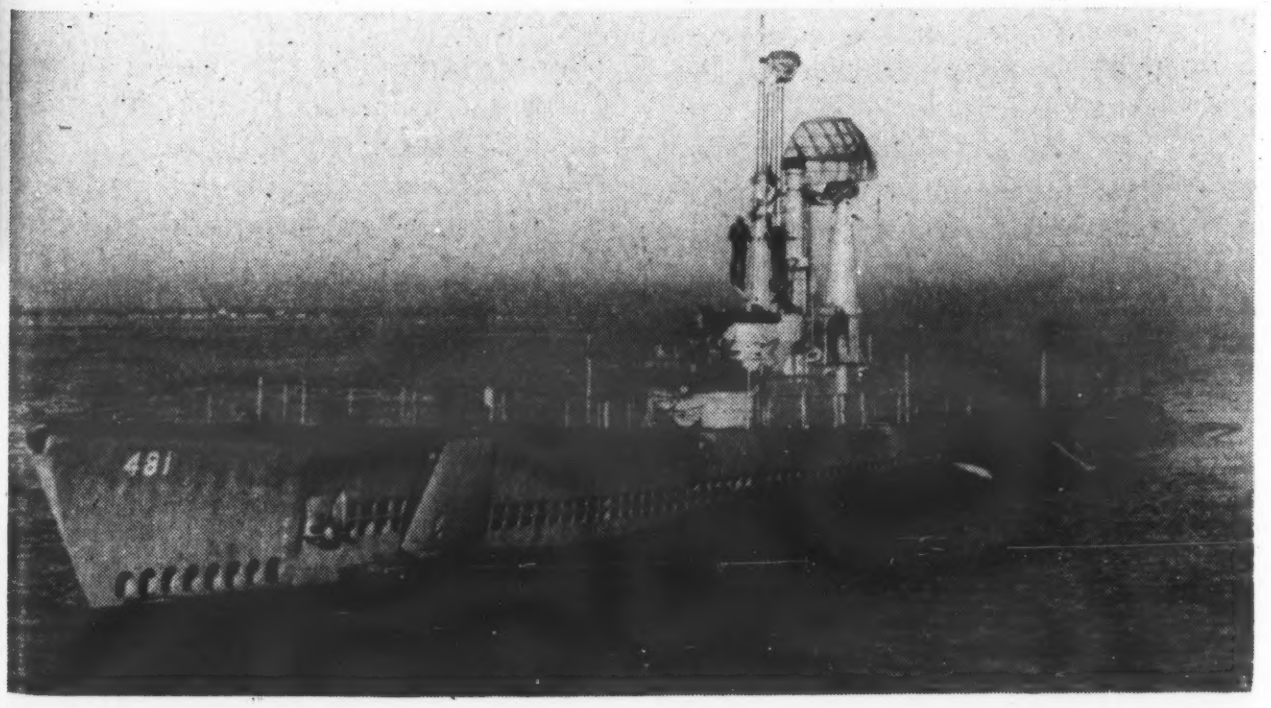
a. Elected the officers and directors.

b. Amended Articles II of our constitution so that active duty officers of the services may be elected to be national officers of AFCA, but not to receive pay for such service.

c. To continue the present membership rates, but to permit group members paying $200 annually to name 10 individuals for free membership in the association.

d. Acted on the recommendations of the Gary committee. Since the principal recommendation was that greater influence and increased membership depended upon the activities of the several chapters, there was a lively discussion concerning the future of AFCA, how individuals might be interested in it, whether the purposes and objectives should be changed.

The radar picket submarine, USS *Requin*, which the AFCA visitors toured at the Naval Gun Factory, Washington, D. C.



Vice Admiral John Dale Price, Deputy Chief of Naval Operations, at the AFCA National Meeting, Washington, D. C.

There is one thing that sets a man apart from his relatives in the animal world. And that is the ability to convey his thoughts to others. This ability has enabled him to create a civilization in which living is immeasurably better than if communication had never been perfected. And as this civilization has advanced, so have the methods of communicating advanced, until today we have such a complex system that not only can thoughts be projected around the world, but even pictures can be transmitted great distances.

As communications is the keystone of our civilization, so is it the most modern of our sciences. Just as nothing is deader than yesterday's newspaper, nothing is more immediate than a present thought translated into words. No one, I am sure, realizes this more than the armed forces; without the ability to transmit orders and information rapidly, the Navy could not efficiently do its job. If we didn't have facilities to maintain control of our naval forces stationed throughout the world from headquarters here in Washington, there would be chaos. And the shaky peace that we are all doing our utmost to maintain would have little chance of fulfillment.

Presentations

During the course of the convention, AFCA honorary memberships were presented to Admiral Denfeld, Chief of Naval Operations, and General Hoyt S. Vandenberg, Air Force Chief of Staff. The presentation to Gen. Vandenberg was made by General Sarnoff, General Ankenbrandt, and General Sherrill. Honorary life memberships were presented to Admiral Stone, General Akin, and General Ankenbrandt.

Special certificates of merit were awarded to:

David Sarnoff, for his leadership as the first president of the AFCA.

Dr. A. H. Taylor, for his outstanding work in the development of radar and many other communications devices. (Dr. Taylor retired from Naval civil service early this year after many years of service.)

George R. Call, for his initiative in developing a plan for the better emergency use of radio amateurs and their stations and for presenting the plan to the Secretary of Defense.

Frank Wozencraft, for his contributions of legal advice and other suggestions for the benefit and improvement of AFCA during its first three years, 1946-49.

RADIO RELAY—

The War's Great Development In Signal Communications

By Maj. Gen. W. S. Rumbough, U.S.A. (Ret.)

On the morning of D+2, 8 June 1944, First Army put its radio link station ashore on Omaha Beach and at 1314 it went into operation from the bluff above the Beach. The Headquarters in Normandy was thus in communication with a similar station on St. Catherines Hill, Isle of Wight, and through that station with the IX Tactical Air Force at Middle Wallop or the 21st Army Group, near Portsmouth, and through switchboards at these headquarters with the general wire system of the American and British armies in Southern England.

Thus was inaugurated the use of radio relay in United States operations in the European theater. The success of its application there can be credited to Colonel Grant Williams, First Army Signal Officer, and Colonel E. Blair Garland, IX Tactical Air Force Signal Officer.

This was not ordinary, old familiar radio, with a single channel, an isolated circuit, separate from the general communication system. This new radio relay system was multichannel; it had several speech circuits and several teletype circuits and it transmitted pictures and sketches.

Perhaps the most striking feature was that it connected directly into the telephone and teletype switchboards at either end. These radio circuits thus became much more efficiently usable, being the approximate equivalent of wire circuits. Moreover, the equipment was more stable, more reliable and more easily kept in operation than we in the European Theater of Operations had dared hope. We had feared that operation would be "tricky" and that only long-trained "experts" could handle the equipment. This proved not to be the case.

This was new equipment; development had been rushed through the laboratories; the manufacturers were building the equipment under intense pressure from the Chief Signal Officer. Shipments were being made to us in the ETO as rapidly as the sets could be seized from the production lines. And this intense pressure to manufacture, to ship to the Theater and to issue to the troops continued to saturation. Tables of Allowances had not caught up with this equipment.

Courtesy Military Review.

296 Installations by VE

At Theater Headquarters we kept informed of the relative needs of the several Army Groups, Armies, Air Forces, and forward sections of Communications Zone, and as new shipments were received we issued the equipment immediately in accordance with requirements. On VE-day there were sufficient sets issued in the ETO to provide 296 point-to-point installations or seventy-four 100-mile systems, each of these seventy-four systems comprising two terminal stations with spares. These qualities were actually in the hands of users on VE-day after certain small combat losses had been replaced.

Major General William S. Rumbough was Chief Signal Officer of the European Theater of Operations during World War II.

After serving as an infantry officer in World War I, Gen. Rumbough's service was continuously in the Signal Corps until his retirement in 1946. He is a graduate of the Army War College, the Command and General Staff School, the Signal School, and has B.S. and M.S. degrees from George Washington University. He holds the Distinguished Service and Bronze Star Medals for his World War II service.

Gen. Rumbough retired from his country's service in the Army to dedicate himself to the education of young Americans. Since retirement he has taught in the public schools in Virginia, and in addition has studied at George Washington, receiving his Master's degree in Education in 1948 and his Doctor's degree in 1949. He becomes principal of the Falls Church, Virginia, High School July 1, 1949.

Radio relay equipment is a revolutionary development in communications. Looking to the future of the Army, it seems certain that radio relay will have an important effect on the make-up of new tables of organization of communication units from the division all the way back through the Communications Zone. Its general features will be studied at the service schools because it will be a potent factor in the control of military operations.

Every commander and every staff officer who is responsible for operations will want to know what service

he may expect from radio relay; he will be interested in its mobility, its transport and its location in his road columns or landing craft and in how to direct its general employment. This brief article will be restricted to general features of the equipment; it will be non-technical.

Radio Relay Competes with Wire

Most of the radio relay equipment in the European Theater was used forward of Army Group Headquarters. Here it competed with field wire, with spiral-four cable, with rehabilitation of French, Belgian, and German open wire and cable and with Signal Corps construction of open wire and cable. All these types were used and each had special advantages in special situations.

For long-term use, newly constructed standard type open wire or cable circuits were best in quality and reliability, but they were most expensive in time, in troops and in transportation. Such construction could not keep up with the rapid sweep across France from Normandy to the Siegfried Line.

Rehabilitation of French open wire and cable was indicated whenever a tactical axis followed an existing circuit route. However, destruction had been severe. Our own air bombing had destroyed enemy air fields, rail road yards, bridges and other military objectives and, with them, all the communication lines in the vicinity. In their retreat, the Germans had effected widespread demolition, including repeater stations and any bridge and bridge-supported cables which had not already been destroyed by our air bombardment.

In addition, there was much battle damage to wire lines and cables. As a result, considerable time and effort was required to restore existing lines and cables to operation, and in many cases destruction was so complete that forward units could not rehabilitate lines in time to meet their requirements. It remained for Communication Zone troops and French telephone men to place these lines and cables in service to serve as the backbone of the rear area communication system to control supply, administration, and evacuation.

Wire Disadvantages

Field wire could be laid rapidly; it was used in enormous quantities, over 900,000 miles being consumed in the ETO during the eleven months of operations, 105,000 miles of it during the last month prior to VE-day. However, field wire was suitable for distances only up to about twenty miles. Spiral-four cable was the closest competitor of radio relay. It could be laid rapidly in the manner of field wire, placed on the ground, tied to trees, draped on top of hedges. But, even though tough and heavy, it was not proof against black-out traffic, road repair operations, construction projects, tanks moving off the road, and other hazards of congested areas.

This field wide type of construction was permissible for short distances when circuits had to be produced quickly, but for longer leads it was subject to too many interruptions and required excessive numbers of maintenance men. For long circuits involving repeater stations, spiral-four was placed overhead and tied up carefully, usually being suspended from messenger wire.

It was the general case, rather than the exception, that long circuits were required or desired faster than any type of wire circuits could possibly be installed. The big advantages of radio were that it could be put into operation quickly and it needed few maintenance men. Radio relay retained these advantages and had the additional ones that a single installation furnished several telephone and several teletype circuits and that each of these circuits became a part of the general communication system and was readily connectible with any telephone or any teletype machine in the system.

The virtues of radio relay were striking and of vital importance. The equipment was in tremendous demand by the Signal Officers of all Army Groups, Armies, Air Forces and forward sections of the Communication Zone. Demands were so urgent that the Theater Signal Officer found it desirable personally to receive requests for it and to direct issues of new equipment as it was received.

What the Equipment is Like

Radio relay differs from the usual field radio equipment in several important respects. One is that it remains in operation continuously. Its circuits are out of service for only a few minutes each day while the circuits are being realigned and the equipment maintained. This period is generally designated as a precisely fixed time shortly before dawn or at some other time when the circuits are expected to be in least demand. Care is taken to have spare transmitter, receiver, gas engine generator, extra tubes and other parts at each station and to have a radio repairman and a power equipment maintenance man on each shift.

The sets are used in rotation and as soon as a switch is made, the attendants check the equipment which has been removed from service and prepare it for operation in its next turn or for immediate use if trouble should develop in a component which is currently in service. Anyone who has been responsible for the operation of small stationary gas engine driven power plants would probably guess that this was the most difficult part of the equipment to keep in operation; this guess would be correct. Eternal vigilance was necessary on the part of the gas engine maintenance man and high standards of maintenance and good supervision were required of the officer in charge of the system.

Power Sources

When stations were dependent on their own small power plants, as was usually the case with relay stations, since they were generally located on isolated hill or mountain tops, and as was often the case with terminal stations, the officer in charge generally had a specified schedule to shift from one generator to another at each station. A procedure used in the ETO was to make the shift every three hours, changing over instantly and simultaneously on a signal transmitted over circuit number one, the engineering circuit, all stations having been alerted a few minutes before the schedule time and all switching immediately on the signal.

At each new location, the station crew explored the possibility of taking the station's power from any nearby Diesel, large gas engine driven generator or other source of electric power in order to save wear on the station's own small, light-weight equipment. No claim is made that radio relay operated perfectly in the ETO. However, by reasonable standard, it was "reliable." Its performance greatly exceeded our expectations.

Another difference from usual field radio equipment is that radio relay is duplex in operation; that is, the transmitting and receiving circuits are both in operation continuously: both are "on" simultaneously. With the usual field radio it is impossible for the listener to break in on the talker because the latter's receiving circuit is "out" while his transmitting circuit is "on" and he could not hear an attempted interruption. Since both the receiving and transmitting circuits of radio relay are in opera-

tion continuously, the listener can break in at any time. This makes the conversation natural and more efficient of circuit time; it is like talking over a wire telephone circuit and, in fact, the users would not know whether they are talking by radio or by wire except that the switchboard operator cautions when the connection is made, "You are using a radio circuit; you are cautioned not to divulge secret or confidential information." Some Signal Officers believe such a caution redundant since it is also forbidden to discuss secret or confidential matters in the clear over wire circuits.

Many Channels With Relay

This duplex operation necessitates the use of two frequencies between each two stations in the chain, one to carry the conversation one way and the other the other way. A hundred-mile set-up using three relay stations and two terminal stations has four station-to-station links, and since the frequencies must not be duplicated within this range, such a chain of stations uses four times two, or eight different frequencies. This is expensive of frequencies, of course, but there are 300 frequency settings available within the thirty million cycle band of the equipment, which covers from 70 to 100 million cycles. The equipment is frequency modulated and thereby is less subject to interference than if amplitude modulated.

Another important difference between radio relay and usual field radio is that the latter is single channel whereas radio relay can be, and almost always is, used in conjunction with telephone and telegraph carrier equipment to produce several channels of each. The field telephone carrier produces four telephone channels and telegraph carrier can be superimposed on one or more of these telephone channels to produce four teletype channels for each telephone channel so used. The possible combinations are: four telephone and no teletype; three telephone and four teletype; two telephone and eight teletype; one telephone and twelve teletype or no telephone and sixteen teletype. The combination which usually best fits the need is three telephone and four teletype.

A fundamental disadvantage of radio is that it is subject to interception. The radio relay equipment used in the ETO had this disadvantage, but to a less degree than the usual type of radio. Radio relay employs such very high frequencies that reception is restricted almost to line of sight; moreover, its di-pole antenna is beamed on the distant station with which it works and the angle of dispersion is relatively narrow. Hence, in order to listen in on a transmission over one of these circuits, an enemy would have had to be either very near the station or else be almost in line with the two stations and up on an elevation.

We monitored various of our radio relay circuits from time to time and found considerable information being transmitted which was dangerous and which would have been more dangerous if our armies had been in static position. It was verified when higher German headquarters and installations were captured and through investigations after VE-day, that the Germans did have the ample and efficient radio and signal intelligence organizations which we had expected them to have. However, these services operated under the serious disadvantage of being forced frequently to withdraw their stations to the rear under the pressure of our advance. This handicap applied particularly to elements which would have had to be located close up to the front in order to intercept our short-range transmissions such as radio relay.

It would be impossible to make an authoritative statement that the Germans had never intercepted important radio relay traffic but it is believed that they did not. At any rate, nothing occurred during the operations to indicate that they had made use of any intercepted American radio relay message. It was fortunate for us that radio relay was needed urgently only during rapidly moving phases of operations and that when, from time to time, our advance was temporarily checked, time became available to install spiral-four cable or open wire or to rehabilitate existing wire or cable circuits and thus to be able to relegate radio relay to stand-by or emergency use.

Speed and Economy

The characteristics of radio relay which made it outstanding in fast-moving operations were its speed of installation and its economy of personnel and transportation. In World War I the speed of attack was that which infantry could make through organized defenses. Each mile was won at the cost of terrific losses and the attack thus became weaker and weaker until it was halted through sheer exhaustion. Even the most carefully prepared and prodigally supported "drive" with selected units in the assault and backed up by reserves massed in rear, lost its punch within three or four days. Five, six, a dozen miles was termed victory.

But World War II moved swifter and farther. The basic pace was that of mechanical vehicles and the speed with which the armored spearhead could be supported. Immediate support was by infantry in trucks and by air bombing and strafing. This immediate support was followed by infantry on foot, mopping up and cleaning out pockets of resistance but with other elements moving forward in route column. Further support was given by the advance of weapons of all types, by supplies moving up by road and railroad and with more urgent shipments by air. Close air support was essential and this meant that damaged enemy air fields had to be repaired and new ones constructed close behind the forward elements. Evacuation of wounded had to be taken care of daily, hourly.

Once the enemy defensive line had been breached in Normandy, the attack moved so swiftly as to prevent the defeated troops reorganizing a defense in Western France, and for 400 miles the attack pushed with incredible speed against an enemy who was being by-passed, confused, routed in detail and blasted from the sky.

Installation Advantages

None of these things could have been done without direction and coordination and when one thinks of direction and coordination he is thinking of signal communications. Effective communication was the key to the success of our operations, and during the vital periods when those operations were moving fast, radio relay was the key to effective communications in the forward areas. Radio relay could be installed quickly, it could be moved swiftly to meet a changing situation, it carried great volumes of traffic and it made minimum demand on road space, on personnel and on our hard-pressed supply system.

The great advantages of radio relay over wire circuits which could carry equivalent traffic is shown best by figures. Material for a 100-mile wire line with four wires weighs ninety-four ship tons, whereas radio relay for that distance weighs only twenty-five ship tons. The construction of such a wire line would take four battalions, or 1,820 men ten days, while forty-four men can install the equivalent radio relay and put it into operation in two days or less. Moreover, after the wire line has been constructed every foot of it is vulnerable to bombing, sabotage, demolition, acci-

dents from vehicles; even buried cables were cut by bulldozers, graders, etc.; whereas a radio relay system is subject to trouble at only the two terminal stations and the two or three relay stations, and there are always alert men at each of these points to prevent or to correct immediately any interruption.

The equipment is adaptable for installation in trucks or trailers or in the Hut HO-17 (modified for increased headroom); this hut being designed to fit in the 2½-ton, 6x6 truck body and to be readily removable (by crane) for placement on the ground at the site selected.

At Bristol, England, in April 1944, the First Army installed the pilot model of its radio terminal equipment in a one-ton trailer in less than two working days. Additional installations were made rapidly and were completed in time for the Normandy invasion. The carrier terminal equipment was installed in a 2½-ton, 6x6 cargo truck and this truck towed the radio trailer. Thus the entire equipment for the terminal for three telephone and four teletype circuits and the operating personnel was placed on the road as a single truck and trailer unit. Complete equipment for a relay station was installed in a 1½-ton, 6x6 truck. Many different variations of these installations were made in the ETO, and almost invariably each crew which made an installation felt that it had the perfect solution, that it had the neatest and most efficient setup in the Theater.

When used at and forward of Army Headquarters, stations are apt to move frequently and it is a great advantage to have the equipment installed in a vehicle, but for rear area stations it is generally more convenient and certainly more economical of transportation to set up in a building or tent and thus to release the transporting vehicles for other duty. When this is done, of course, there must be longer notice of an impending move and high priority must be given for the necessary vehicles to carry the equipment and personnel to the new site.

Radio Relay in Operations

Specific examples of the use of radio relay show its value. Radio relay made its reputation from the start, in North Africa, in Sicily and in the first campaigns in Italy, even though this early equipment provided only a single duplex channel of teletype. The first long circuit was from Allied Force Headquarters at Algiers to Hill 609 in Tunisia and thence to mobile stations at Bizerta and Sidi-Bou-Said (near Tunis). The total length was 379 miles using four relay stations. The longest span was 120 miles between the relay station on Tuorka at 4,900 feet elevation and the relay station on Djebel Ouasch at 4,200 feet elevation. This circuit carried the bulk of operational and administrational traffic for the II Corps, the load reaching a maximum of 16,000 words per day, 12,000 with Algiers and 4,000 between the forward terminals. Due to the rapid movement of II Corps Headquarters and the great distances covered it was impracticable for wire circuit construction to keep up with the advance. Hence these radio relay circuits were vital to the operations.

243 Mile Circuit

From the opening of the Sicilian Campaign on 7 July 1943 until 9 August 1943 a duplex radio teletype circuit was operated between Sidi-Bou-Said and Malta with relay stations on Cape Bon and Pantelleria, a total distance of 243 miles, all over water. The longest span was that between Pantelleria and Malta, 148 miles. The station on Pantelleria was at an elevation of 500 feet and that on Malta 800 feet; application of the formula for line of sight gives seventy-two miles as the limiting distance but communications were good in spite of this doubling of the theoretical limit.

Radio relay was the main reliance between Anzio and Headquarters Fifth Army at Presenzano and this installation illustrates flexibility in the routing of radio relay. There is a high range of mountains on the direct route; these were in the hands of the enemy and therefore unavailable for radio relay sites. The solution was to place the relay station back near Naples, far in rear of both terminals but with a good line of transmission to each terminal. Traffic reached 20,000 words per day, furnishing instantaneous communications from Army to VI Corps and through the Corps teletype switchboard direct to the divisions in the Anzio operation.

Mention has already been made of the circuit across the English Channel to the Normandy beachhead and of the sensation created by this first tactical use of multichannel radio relay. The cross-channel span was eighty-three miles although the calculated limiting distance for the 800 feet elevation of St. Catherines Hill and the 160 feet of the Normandy site is only fifty-eight miles. The value of these switchable telephone and teletype circuits and of the facsimile transmission of information and targets on aerial photographs was very great.

It became routine procedure early in the Normandy operations to install radio relay channels paralleling wire channels between army group and armies and between armies and their respective corps. Whenever considerable distances separated corps and division command posts, radio relay channels were also used by corps to assure communication with the distant division command posts. There were hundreds of these forward area circuits installed. They were usually put in quickly, were operated as auxiliary circuits; sometimes, and especially immediately after a long move, as the sole speech circuits. When CP's moved again, these radio relay installations were pulled out and were reinstalled to serve the new locations in phase with the progress of the operations.

Rear Area Use

Radio relay was also vital for long circuits in the rear areas. Owing to battle damage and German demolition, it was frequently impossible to rehabilitate enough French, Belgian, or German cable or open wire circuits to carry the vast volume of message business. Radio relay proved an excellent solution, the sole solution in many cases, because priority in assignment of signal construction units was given the forward elements; their need for construction progressed across the Continent and was never ending. From D-day to VE-day and afterward, the ETO Signal Office received daily pleas from Armies and Army Groups, "Send us more line material, more construction troops."

A few construction units had to be allotted the Base Sections of the Communication Zone in order that they might be able to maintain the rear area lines on which supply to the front depended and in order that they might furnish communications to new ports and depots as the operations moved eastward, but there were seldom any construction units available to build new lines in the rear. Consequently, reliance had to be placed upon rehabilitated civilian lines. These were often too meager to provide the circuits required and when this was the case we often resorted to radio relay. There were radio relay circuits from Paris to Cherbourg, to Deauville, to London, to Namur, and to Vittel.

The Air Force also had a considerable network of radio relay circuits

tying in from Headquarters at Chantilly, near Paris, to their Advance Headquarters, to their Tactical Headquarters, to Bombardment and to Fighter Wing. The Ninth Air Force had the distinction of having the longest radio relay circuit in the ETO, that between Chantilly and Bad Kissingen, Germany. This circuit used two terminal stations and eight relay stations. The sum of the distances between stations was 410 miles and the direct air line distance between the terminals was 390 miles. In spite of the long distance and eight relays this circuit was "in service" about ninety percent of the time.

Another use of radio relay resulted from a bitter experience at ETO Headquarters. Our big 40-kilowatt radio station for communication with Washington was located about twenty miles southwest of Paris. It was keyed from the Signal Center Blockhouse in Paris by French circuits in the Paris-LeMans cable. Unfortunately, this cable skirts the edge of the railroad yards at Trappes and this yard had been heavily bombed by our Air Force. French and American cable splicers had repaired this cable when the headquarters of ETO moved from Valognes to Paris early in September 1944. The cable was put into service; the circuits operated well and we settled ourselves to what we hoped and expected would be an indefinite and uninterrupted use of the cable.

We felt our U.S. link secure. But such was not the case. A heavy rain, a thorough soaking of the ground, moisture in the cable through two unsuspected cracks in the sheath and out went our vital keying circuits. The obvious remedy, and one quickly applied, was to place an additional radio relay station atop the Eiffel Tower, another at the big radio station, and thus to restore the direct keying circuits. Losing them once was enough. When the cable was restored we went back to wire circuits but we did not remove our radio relay paralleling link and it saved our Washington communications when the cable failed the next time.

We learned in September 1944 that new troubles may occur at any time in a bombed cable. One might think that a thorough soaking would penetrate every crack or pin hole of a buried cable and that all prospective troubles might be thus revealed and repaired at one time; but such was not the case. A prospective trouble might survive the first heavy rain and succumb to the second or to the third or fourth. Troubles were unpredictable. Ability to bridge a gap, such as this twenty-mile link from signal center to radio station, was a most valuable asset to a signal officer and, in the ETO, we all tried to keep two or three radio relay stations in reserve for such an emergency.

Colonel Grant Williams, Signal Officer, First Army, thus describes the use of radio relay at Bastogne: "In November we had done some experimenting using the Radio Link, AN/TRC-3, in a moving vehicle. We had a complete terminal set with CF-1 and 2 carrier equipment and a teletype machine mounted in a truck. When it looked as if the 101st Division was going to be surrounded at Bastogne, the Corps Signal Officer (whose young assistants had done the building) sent the truck towing a trailer (with an additional terminal set as a spare installed) into Bastogne. It was the last vehicle to enter the town before the Germans completed their encirclement. The trailer was hit and destroyed. However, the truck was undamaged, and throughout the entire period until they were relieved, the Corps had telephone and teletype communication with General McAuliffe.

"Wire communications would have been impossible, as naturally the Germans would have cut the lines. Ordinarily, now, I keep the Radio Link as a stand-by, but whenever, due to line failures, the number of channels to any of my units falls below a fixed standard that I have set, the Radio Link is placed in service and remains in service until the wire facilities are completely restored. It is the best agency we have to meet the unusual, the unexpected and the difficult situation.

"Going back further, I may say that the rapid advance of late last summer across France and Belgium would have been much more difficult and certainly slower if we had not been able to maintain an adequate scale of communications by its use. Never had field armies like the First and Third had communications on such an adequate and successful scale, entirely due to unimaginable hard work and such equipment."

Radio relay was also valuable in the Pacific. Used at Hollandia in May 1944, it furnished circuits quickly. While the links involved were short (six, two and fourteen-mile jumps) the terrain was rugged or swampland and the roads were narrow; the radio relay circuits served well until replaced by pole lines. Prior to the Leyte landing, several small ships had been allotted as floating communication centers and had been equipped with radio relay and associated carrier equipment; also a 1½-ton truck had been made into a radio relay terminal. At H+2 hours, LCM's carrying this truck and additional radio relay equipment for other shore-based stations, headed for Red Beach; within twenty-five minutes the truck station was in communication with the ship stations.

At H+5 hours, General MacArthur went ashore and made his famous "I have returned" broadcast. This speech was picked up from shore by General Headquarters afloat and was rebroadcast to the Philippines. A Signal Corps communication ship recorded the broadcast and it was retransmitted to the United States later that day. Twenty-two radio relay terminals were used in the Leyte operations, handling telephones and teletype operational traffic and broadcasts.

In preparation for the Luzon operation, six 2½-ton trucks with trailers were fitted as mobile radio relay terminals; these performed indispensable service in the landing at Lingayen Gulf and in the subsequent rapid advance to Manila. Dagupan, twenty-five miles to Camiling, twenty-seven miles to Tarlac, twenty-four miles to San Fernando, twenty-two miles to Malolos, thirty-two miles to Manila. Each of these was first the forward terminal, and later, by back-to-back installations, became the relay station along the route of reconquest. By 10 March 1945, sixteen radio relay terminals were handling seventy-five percent of voice and teletype traffic in and out of Manila to remote points on Luzon.

These examples show that in World War II, radio relay has furnished thousands of vital circuits which could not have been provided as quickly by wire construction even though our forces had been provided unlimited numbers of signal construction troops and even though these troops had been given "clear the road" priority for bringing up their poles and wire. Four battalions, a total of 1,820 men, would require about ten days to construct a four-wire pole line one hundred miles long; radio relay teams totaling forty-four men can install their equipment and provide equivalent circuits in less than two days. These figures —2 days against 10; 44 men against 1,820; 88 man-days against 18,200— show why radio relay, competing for the title against many items of new and marvelous communication equipment, both wire and radio, is called the communication sensation of World War II.

For the Unified Services

ONE VOICE OF COMMAND

By Donald Becker

They lifted the security lid in the Pentagon just a crack the other day to throw light on a seldom-mentioned but vital aspect of unification of the services—joint communications.

So vital, in fact, is this aspect of unity that joint communications began to evolve many years before the services were unified. Then World War II came along to underscore the necessity of having all the Armed Forces speak with the same tongue, and the evolutionary process speeded up.

The goal hasn't been easy to achieve, even though the need has been recognized for a long time and the pressure of war brought much progress. Top-level communications people of the National Military Establishment still are hard at work on the problem they foresaw in the thirties. But with the objective now nearly attained, the Secretary of Defense explained some of the ramifications.

For a concrete example of what's needed, take the Okinawa campaign. In April, 1945, the Army, Navy, Marines and Air Force jointly concentrated American might on the island and broke Japanese resistance in their own backyard.

Simple, after you have the men, the ships and the supplies?

No; because a joint operation like Okinawa requires coordination of command.

Well, isn't that merely the willingness to get together?

Again, no. Just as you can't have command without communications, neither can you have joint command without joint communications. (The Army Signal Corps, for example, points out that you can't have a fighting force at all without direction, and likes to call its communications "the voice of command.")

Joint Procedures Evolution

But what's so difficult about joint communications? Can't an Army commander just message the Navy on how many landing craft he needs, and the Air Force for fighter cover?

Yes, he can—now. But handling a message accurately and securely in three-dimensional mechanized warfare of supersonic speed isn't quite as easy as telephoning your neighborhood grocer and asking him to make an emergency delivery of bug bombs.

Before disclosing (within security limits) what is being done to give unified command a single vocabulary of command, let's have a quick look at the changing demands on communications, as warfare becomes more and more complex. Let's go back to an era when men were shooting at each other in a relatively simple manner. That, so far as the communications people are concerned, isn't very far back. It's the era of World War I.

In World War I there was only a small Air Force, and Naval engagements seldom involved land forces. Each service did its own job. There were no joint operations in the modern sense and therefore no need for joint communications.

This happy simplicity continued for a decade after the First World War. Communications procedures and equipment that were developed independently by the separate services were allowed to expand in their separate paths. The Army and the Navy felt they had different missions. Their methods of communicating orders to accomplish their missions were different, too.

But about 1930, defense planners began to realize that the services would be interdependent in a new war and therefore should have the means — the communications — to work together. The most obvious need was for common procedures. If a Navy message were to be delivered to an Army addressee, then both sailors and soldiers would have to understand the symbols on it. Yet they did not, because the individual procedures of each service had been strongly flavored by the traditions of each. They simply did not speak the same version of the English language.

Long-established principles, based on individual service requirements, made establishment of joint procedures difficult. No one procedure would fit precisely all the requirements of each service. Numerous

Just as you can't have command without communications, you can't have joint command without joint communications.

joint radio telegraph procedures were invented after 1930, but none was found satisfactory by either Army or Navy to the extent of being put fully into intra-service use. Each service made its own adaptations.

Under the impact of World War II, however, the services finally evolved a single radio telegraph procedure for both inter-service and intra-service use. The system subsequently was composed with British practices, bringing a combined procedure that could be used by the United States Navy, the United States Army and Air Forces, and the British forces.

After this achievement, joint procedures were found for radio telephone, and lastly, for teletype tape relay. As a result, elements of all the United States services could intercommunicate rather freely. Some ironing out of procedure details is still to be done, but the achievement is now practically complete.

JCB to JC-EC

The agency that devised the new procedures of communications for the United States Armed Forces was the Joint Communications Board (JCB) and its predecessor, the Joint Communications Committee. The JCB came into being July 14, 1942, and was designated a supporting agency of the Joint Chiefs of Staff. Its name was changed on May 21 of this year to the Joint Communications-Electronics Committee, but its functions have remained nearly the same as those it performed during World War II.

It was the pressure of war that brought the evolutionary process to fruition. The major battles of the recent conflict were joint affairs. They demanded close coordination of all the services. Whoever called the signals had to call them in a tongue that all could understand. For communications to falter on a beachhead would be fatal. Joint operations required joint communications. That's all there was to it.

So let's take a closer look at the Okinawa campaign—the last of the war—for a more complete understanding of the new role of communications in modern warfare. After that, there will be presented a glimpse of that hush-hush offspring of the Joint Chiefs of Staff already mentioned, the Joint Communications-Electronics Committee.

The Ryukyu campaign began March 17, 1945, with preliminary naval and air strikes against the entire island chain. These strikes were coordinated with strategic bombings of the Japanese home islands. The objective, as recorded in Tenth Army's Action Report, was to "capture, occupy, defend and develop Okinawa Island and establish control of the sea and air in the Nansei Shoto area."

Okinawa Joint Operation

This amphibious operation was a joint one from its very genesis. The mission was handed to Fleet Admiral Chester W. Nimitz, the Pacific commander, by the Joint Chiefs of Staff. Admiral Raymond A. Spruance became commander of the operation; Vice Admiral R. K. Turner was commander of the joint expeditionary forces; and Lieutenant General S. B. Buckner was the commanding general of expeditionary troops. Officers from all services were integrated into the staffs that planned the campaign. Task force units that finally converged on Okinawa were spread all over the Pacific, their movements coordinated by joint communications. They came from the West Coast of the United States, Hawaii, the Russell Islands, Guadalcanal, the Philippines, New Hebrides, the Marianas and Ulithi. When landings began and the forward echelon, Headquarters, Tenth Army Command Detachment, was on a ship off Okinawa, the rear echelon was at Schofield Barracks, Hawaii.

This was global warfare, held together by the invisible strands of a communications net. And it was joint warfare. Expeditionary troops had to be carried to their target by assault shipping. Naval attack groups had to pave the way. Aircraft were required for support. Air defense involved a screen of radar-equipped Naval craft, land radar, fighter planes, anti-aircraft guns, and joint communications over which to receive warnings and issue orders for countermeasures. After troops landed, Joint Assault Signal Companies were the primary factor in the control and delivery of Naval gunfire in close support.

Listen to the Tenth Army Action Report for a sample of wartime teamwork in supplying joint communications:

"When the Corps Headquarters came ashore a radio teletype network . . . was inaugurated between the command ships, Tactical Air Force, and the Corps Headquarters ashore. Army Headquarters entered the net when the Army Command Post was established ashore. All equipment and personnel for the operation of this net were furnished by the Navy."

Assault Communications

Just what signal activities were involved in making the Okinawa beachhead? Here are some of them:

1. Provision of a combined assault code.
2. Fire control.
3. Operation of boat, aircraft and ground messenger services.
4. Shore-to-ship visual communications.
5. Early warning air raid net, with teams filtering information from both ship and ground radar.
6. Joint Assault Signal Companies to establish initial beachhead communications, with the assistance of combat troops.
7. Construction of telephone lines.
8. Wire, radio and radar repair.
9. Establishment of supply depots.
10. Photographs for intelligence, historical record, and press.
11. Handling traffic for Expeditionary Force Messages (personal messages from individual soldiers, sailors, and marines), press, and Red Cross.
12. Establishment of a Joint Communications Center ashore, starting with a Mobile Communications Unit. It was staffed with Army, Navy and Air Force personnel.

Mobile equipment made communications possible soon after landing.

For the week ending April 14, which was two weeks after the assault, Tenth Army handled 15,000 words of radio traffic. This increased to a peak of 475,000 words for the week ending June 2.

The joint communications combat mission was a tremendous one, and it was accomplished. (So was the parallel job, just as huge, to establish the communications for base operations once the beachhead was won.) But it was not without some faults. Most of the faults appeared after the huge machine got under way. Many of them were of little consequence and were corrected on the spot. For example, it was found unnecessary to have both a Naval and Army officer on duty at the same time to handle messages. A reduction in manpower was effected by having only one officer handle both jobs. Some of the problems, however, were of greater magnitude and—although expedients were used to solve the immediate problems—the fundamental changes required could be made only at a higher level than Army headquarters. Typical of such problems was the assignment of frequencies to the three services in such a manner that each service could use its radio sets without interference with the other services.

It was to eliminate such faults after unification of the services that the Joint Chiefs of Staff continued the already functioning Joint Communications Board, later redesignated the Joint Communications - Electronics Committee.

Make-up of JC-EC

The Joint Communications-Electronics Committee consists of the Chief Signal Officer of the Army, the Air Force's Director of Communications, and the Chief of Naval Communications. One or more alternates may be appointed by each member.

Panels—with members representing the three services—do the work of the JC-EC. The members of a given panel generally are chosen because of their particular aptitude in the field of communications or electronics for which the panel was established. In addition, panel members usually draw on the experience of scientists or technicians of their own service. Panels meet periodically, but not on a full-time basis. After a panel has completed a particular job, it delivers the results to the JC-EC. When the JC-EC approves the project, it is passed on to the Joint Chiefs of Staff for final approval and implementation by the Army, Navy and Air Force.

As the need for standardization of equipment and parts is stressed in this article on the Joint Communications-Electronics Board, so it was stressed by speakers at the recent national meeting of the AFCA at Washington, D. C.

Particular emphasis to this problem was given in the addresses of Fred Lack, AFCA President-elect; Leighton H. Peebles, Assistant Director of Production, National Security Resources Board; and Wayne Coy, FCC Chairman.

Communications problems are brought to the attention of the JC-EC by members of the committee, by the Joint Chiefs of Staff, and by the Secretaries of Defense, Army, Navy and Air.

One of the major problems confronting the three services is the standardization of equipment for joint use. Heretofore each service designed and procured equipment according to its own needs, although certain items were in common use among the three services. The JC-EC has undertaken the task of standardizing certain types of communications and electronic equipment that are common to all the Armed Forces. Such standardization will result in greater operating efficiency between the services, a monetary saving (since only one "type" of any given equipment need be purchased), and increased simplification in manufacture. Not only will the Armed Forces gain from this program, but the communications industry will find the problem of producing the equipment required for the Armed Forces considerably simplified.

The JC-EC also is working on electronic aids to navigation, on the allocation of radio frequencies for military use (in conjunction with national and international civil agencies), on problems of communications security and communications procedures, on radio frequency propagation, on recommendations for research, and on the allocation of communications responsibilities for the three services. Just exactly what the JC-EC is doing about these problems constitutes classified information. The Pentagon people didn't lift the security lid high enough to disclose the details.

JANAP's for Uniformity

The top-level communicators in Washington who are involved in all these problems may make the decisions, but the operating personnel in the field are the individuals who carry them out. To accomplish the promulgation of instructions and information to radio operators, communications officers and interested commanders, the JC-EC publishes documents called "Joint Army-Navy-Air Force Publications" known in service vernacular as JANAP's. A common language is used and the objective of these publications is to facilitate training and efficient operation. They are prescribed for use, not only between the three services, but usually within each service as well. Thus is joint communications policy made effective at every level of all three services.

Finally, the JC-EC will study commercial equipment to see how it can be modified for military use. The committee is interested also in learning if the use of a given piece of equipment can be broadened by slight modification. In short, the committee wants to make the most of America's industrial potential.

The effort to achieve completely joint communications acquires added importance as the pace of warfare increases. For example, with aircraft moving at supersonic speeds, a flash aircraft warning must be received at once to be of any value. Should the message become enmeshed in a faulty communications net the result could be tragic. Fortunately, the armed services have gone a long way from the day when they were obliged to use international commercial procedures in order to communicate with one another. The Armed Forces long ago learned the necessity of having one voice of command. Under the Joint Communications-Electronics Committee, the work goes on.

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Lack Speaks at War College

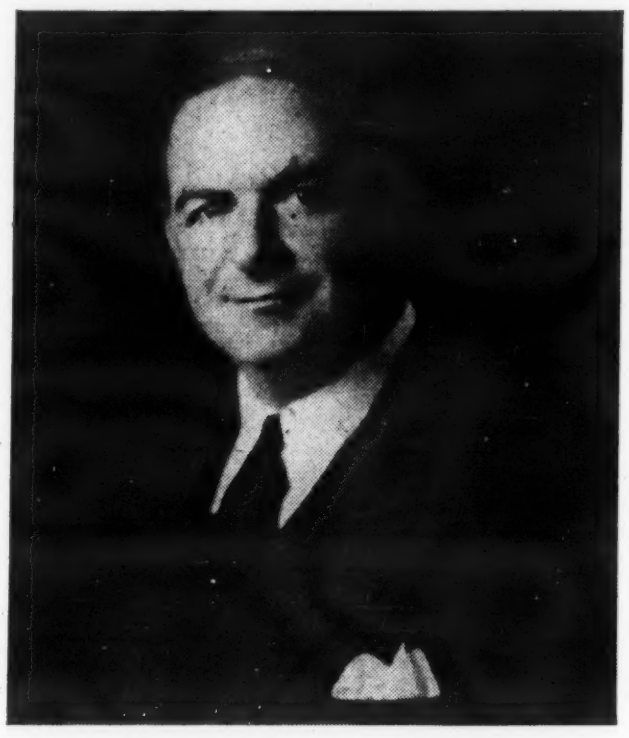
AFCA's newly elected president, Fred Lack, vice president for radio of Western Electric, was honored with an invitation to address the students at the National War College early in February. His address was confidential. Mr. Lack's appearance before the college served to emphasize in the minds of the future Army, Navy and Air Force high level commanders the continued importance of communications in military operation.

Navy Communications Conference

All district communications officers were ordered to Washington for a large scale conference during the AFCA's annual meeting March 28-30. It is expected that at future annual meetings the high level communications officers of all three services will be assembled to participate in the proceedings of the association as well as for conferences with their chiefs in Washington.

AFCA Medals to ROTC Units

AFCA medals have been sent to eighteen ROTC units and will be awarded to the outstanding communications cadet at graduation ceremonies. The names of the winners will be published in the July issue.



Kaiden-Kazanjian
Fred Lack, AFCA's new president will take office July 1st. Vice President in charge of the radio division of the Western Electric Company, Mr. Lack has long experience with government-industry committees for electronics-communications.

Chapters Visited By Exec. Dir.

During the year ending May 1st, the Executive Director paid one or more visits to the following chapters: Atlanta, Augusta, Baltimore, Boston, Dayton-Wright, Fort Monmouth, Kentucky, Louisiana, Philadelphia, Richmond, Spanish War Veterans, South Carolina and Washington.

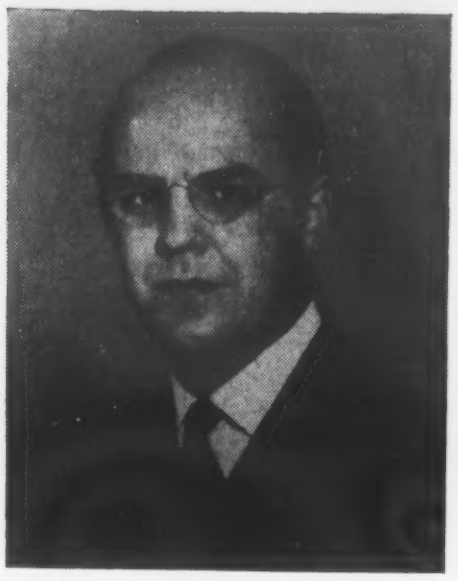
National Advisory Committees

AFCA national advisory committees were established over two years ago with the expectation that the services would refer to them a considerable number of problems especially in industrial mobilization planning. With the formation of many government appointed committees of the National Security Resources Board and the Munitions Board the number of such problems has materially decreased. Some of our national advisory committees have therefore been discontinued. Others covering matters for which government committees have not yet been formed are being continued. These are listed in this issue. AFCA members, both individual and group, should submit any recommendations they may have in mind for the improvement of communications and photography so that we may process them to the services.

The Chief Signal Officer, in commenting on the solutions to problems studied by our committees and chapters, had this to say: "The comments that you have been forwarding from the committees of the AFCA who are working on the problems we submitted have already proved of value to our planning people. . . . We are studying two other problems with a view to asking the help of your com-

Conway Studios

5th V.P. C. O. Bickelhaupt



Ferdnand de Gueldre

1st V.P. Theodore S. Gary

U. S. Navy

3rd V.P. Rear Adm. Earl E. Stone

U. S. Air Force

4th V.P. J. R. Cunningham

mittees and will submit them to you as soon as they have been sufficiently clarified here." It was pleasing to receive the Chief Signal Officer's praise of the Cleveland Chapter's solution to several of these problems: "This was especially true of the comments submitted by the Cleveland Chapter whose report is considered an excellent example of the advice and assistance which the Armed Forces Communications Association can give the military services for the mobilization planning program."

Council Meeting

At the annual meeting on March 28th, chapter-elected representatives to the National Council met for the first time with the Board of Directors. Of the 26 chapters in the continental United States, the following had representatives at the meeting: Atlanta, Baltimore, Chicago, Dallas, Decatur, Fort Monmouth, Kentucky, Louisiana, New York, Philadelphia, Pittsburgh, Richmond and St. Louis. Certainly this is a fine showing for the first year of such a meeting. A number of chapters still have failed to designate their representatives.

Signal Corps Anniversary

The association and a number of chapters sponsored celebrations of the Signal Corps anniversary on March 3rd. The chapters included Baltimore, Kentucky, New York, Philadelphia, Sacramento and the Texas Tech student chapters.

The Chief Signal Officer in Greece reports that the anniversary was celebrated with appropriate ceremonies in Athens, Kastoria and Argos Orestikon. The Hon. Henry F. Grady, American Ambassador to Greece, attended the celebration in Athens. Other guests included high ranking officials of the American, British and Greek forces.

U. S. Air Force

Director, W. G. Eaton

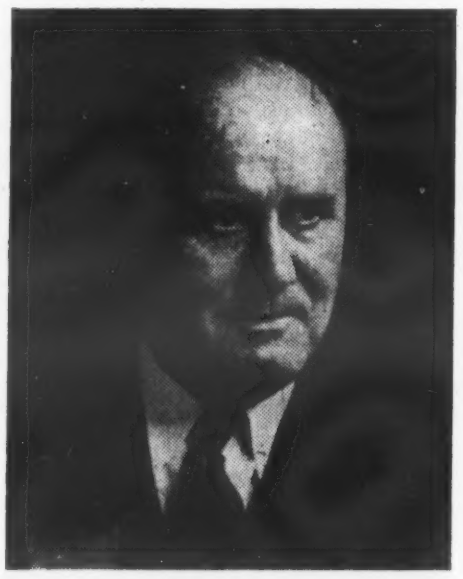
The Commanding Officer of the 4th Signal Service Group, PHILCOM, reports that joint ceremonies by Hqs. 4th Signal Service Group and Signal Officer, Philippine Command, were held at Fort McKinley on March 3rd. Guests included distinguished representatives of the Philippine government and industry, as well as U. S. Air Force, Army, and Navy officials.

Director, Paul Goldsborough

Randazzo & Morrison

2nd V.P. Thomas J. Hargrave

Karsh



Director, Walter Evans

Bachrach

Executive Committee Member at Large, W. C. Henry

Underwood & Underwood

Group Members Represented At National Meeting

The following AFCA group members were represented at the Association's national meeting, Washington, D. C.:

Admiral Corporation
American Steel & Wire Company
American Telephone & Telegraph Company
Anaconda Wire & Cable Company
Automatic Electric Company
Automatic Electric Sales Corp.
Bell Telephone Company of Pa.
Bendix Radio
Capitol Radio Engineering Inst., Inc.
Carolina Telephone & Telegraph Co.
Chesapeake & Potomac Tel. Co.
Copperweld Steel Company
Cornell-Dubilier Electric Corp.
Corning Glass Works
DeJur Amsco Corporation
Federal Telephone & Radio Corp.
Diamond State Telephone Company
General Aniline & Film Corp.
General Cable Corporation
General Electric Company
Graflex, Inc.
Haloid Company
Hercules Motors Corp.
Illinois Bell Telephone
International Resistance Co.
International Tel. & Tel. Corp.
Kellogg Switchboard & Supply Co.
P. R. Mallory & Co., Inc.
Merit Coil & Transformer Corp.
Michigan Bell Telephone Company
Mines Equipment Company
National Carbon Company, Inc.
New England Tel. & Tel. Co.
New Jersey Bell Telephone Co.
New York Telephone Company
North American Philips Co., Inc.
Operadio Manufacturing Co.
Philco Corporation
Radiart Corporation
Radio Corporation of America
RCA Victor Division
Sherron Electronics Co.
Southern Bell Tel. & Tel. Co.
Southern New England Tel. Co.
Sperry Gyroscope Company
Stewart-Warner Corporation
Teletype Corporation
Times Facsimile Corporation
Tung-Sol Lamp Works, Inc.
Western Electric Company, Inc.
Western Union Telegraph Co.
Westinghouse Electric Corp.

National Advisory Committee Chairmen

BATTERY MANUFACTURING: **Dr. George W. Vinal, Bureau of Standards, Washington, D. C.**

DRY BATTERY SUBCOM.: **Mr. Ralph E. Ramsay, V. Pres. & Research Director, Ray-O-Vac Company, Madison, Wisconsin**

STORAGE BATTERY SUBCOM.: **Mr. L. E. Wells, Chief Engineer, Willard Storage Battery Company, Cleveland 1, Ohio**

PHOTOGRAPHIC EQPT. MFG.: **Mr. H. A. Schumacher, V. Pres., Graflex, Inc., Rochester, N. Y.**

PHOTOGRAPHIC SENSITIZED MATERIALS & CHEMICALS: **Joseph C. Wilson, Pres., The Haloid Co., Rochester, N. Y.**

PUBLICITY: **Mr. Orrin Dunlap, Jr., RCA, 30 Rockefeller Plaza, New York 20, N. Y.**

MILITARY TRAINING: **Major Gen. G. L. Van Deusen, Pres., RCA Institutes, Inc., 340 West 4th St., New York 13, N. Y.**

AFCA LIFE MEMBERS

Lt. Col. John O. Aalberg
***Major General Spencer B. Akin**
Major O. J. Allen
***Major General James B. Allison**
Capt. William H. Angel
***Major Gen. Francis L. Ankenbrandt**
Paul Case Armor
Arthur Atkinson
Lt. Col. John W. Atwood
Lt. Edward J. Behn
Col. Sosthenes Behn
Lt. William C. Behn
Major Joseph T. Bernard
Major W. O. Brewer
Carl D. Brorein
Capt. E. C. Bryan
Harold C. Burke
Col. Frank Capra
***Capt. B. Harold Christenson**
Lt. Charles E. Clark
H. W. Clough
Daniel C. Cole
Major Lloyd D. Colvin
Dr. Garett D. Combs
William B. Cook
Bennett W. Cooke
Capt. J. B. Cooperhouse
Major Lawrence J. Corsa
CWO C. R. Crank
Dr. Lee DeForest
***Admiral Louis E. Denfeld**
W. C. DeVry
Lt. Mevio DiMeglio
Pfc. David M. Dixon
Lt. Col. E. E. Ferguson
***Captain Harry E. Fisher**
Col. Sol. Paul Fink
Major Merwin B. Forbes
Capt. James E. Foster
Capt. William L. Gause
Lt. Col. C. W. Gibbs
Lt. Col. David P. Gibbs
Capt. Arthur B. Gibson
Joseph Gorodiz
Capt. Myron J. Green
Capt. Laurence W. Hacker
Major Max W. Hall
W. J. Halligan
Capt. H. C. Hammerly
Capt. F. S. Heath, Jr.
Lt. Col. E. W. Heffner
Col. William C. Henry
Lt. Robert C. Herrick
Lt. Charles T. Hibbard
Col. Boyd B. Hill
Capt. Joseph E. Houk
***Major General H. C. Ingles**
Alexander H. Jackson
Lt. Col. Frank B. Jewett
Lt. Col. J. G. Johnson
Lt. Howard Kaplan
H. Donn Keresey
Lt. Albion W. Knight, Jr.
Col. J. Harry LaBrum
Frederick R. Lack
Capt. Elmer S. Lesher
John Richards MacKay
Col. T. H. Maddocks
Capt. Gabriel W. Marnock
Brig. Gen. A. W. Marriner
***Major General J. O. Mauborgne**
***Major General Harold M. McClelland**
William J. McIlvane
***General Lucien Merlin, French Army, LM, CBE**
I. Allen Mitchell
Capt. L. C. Mohler
Col. F. W. Moorman
Lt. Thomas C. Musgrave
Lt. Col. Jack N. Nahas
Lt. Col. B. I. Noble
Lt. Col. William V. Norton
Cp. John K. Palijas, Jr.
Major E. H. Olsen
W. H. Parkin
Gerald Dayton Peet
Col. Van Ness Philip
Major J. B. Prestridge
***Rear Admiral Joseph R. Redman**
Marcel C. Reeds
Eugene H. Reitzke
Lt. Col. George W. Rhyne
Capt. Thomas M. Reinzi
Thomas A. Riviere
Col. P. C. Sandretto
Brig. Gen. David Sarnoff
Lt. Col. William B. Scace
Capt. James F. Scoggin, Jr.
Col. Henry H. Scudder
Lt. Leroy W. Sellek
Capt. Dale H. Shick
Major Eugene E. Skinner
Capt. Rene G. Smoller
T/5 John T. Snodgrass, Jr.
Edward L. Staubitz
Lt. Col. Andrew D. Stephenson
***Rear Admiral Earl E. Stone**
Lt. Col. Arthur W. Tager
***Air Vice Marshal W. E. Theak, CBE**
Col. S. R. Todd
***General Hoyt S. Vandenberg**
Capt. Walter N. Vincent
***Major General C. H. H. Vulliamy, CBE, DSO**
Jack M. Warner
Col. David E. Washburn
Maj. Hubert F. Wehlitz
Capt. George W. White
Lt. Col. Harold C. Williams
Col. Robert O. Williams
Capt. William F. Wisner
Col. Frank W. Wozencraft
Lt. John M. Wozencraft
Capt. E. G. Wunderlich
Col. Darryl F. Zanuck

**Honorary.*

ANNUAL REPORT

1. Introduction

This report for the third year of existence of AFCA records the growth and activities during the year ending 30 April 1949. The report was prepared by the Executive Director in compliance with Paragraph 20 of the By-laws adopted 29 April 1947.

2. Election of Officers

New officers—the president and five vice presidents—and three directors-at-large were elected in the manner prescribed in paragraph 27 of our By-laws. The newly elected officers, named below, take office July 1, 1949.

President—Fred R. Lack replaces David Sarnoff

1st Vice President — Theodore S. Gary replaces Wm. Halligan

2nd Vice President—T. J. Hargrave replaces A. W. Marriner

3rd Vice President—Rear Admiral Earl E. Stone replaces Darryl Zanuck

4th Vice President—J. R. Cunningham replaces Jennings B. Dow

5th Vice President—C. O. Bickelhaupt replaces E. K. Jett

Directors-at-large:

Walter Evans replaces J. H. LaBrum

Paul Goldsborough replaces J. J. Ott

W. G. Eaton replaces H. A. Zahl

Executive Committee member-at-large—W. C. Henry

3. Executive Committee Meetings

This committee consists of General Sarnoff, Mr. William Halligan, Colonel Zanuck, Colonel Wozencraft, General Sherrill and Mr. Gary. It met in New York August 16, 1948, in Washington, December 14, 1948, and with the Board of Directors in Washington, March 28, 1949. In addition, voting on some special problems was conducted by mail. During the year the policies and activities of the association were under the direction of this committee. Those gentlemen, including several directors, who took the time and trouble to attend these meetings deserve a vote of thanks from all the members.

4. Publishing Problems

Continued increases in costs of paper and printing labor forced us to greater economies although some increased revenue came to national headquarters from the increase in dues and the resultant elimination of the 25c to chapters for renewals. Our printing bill increased about 20 percent in June 1948. A great deal of study was given to the desirability of changing the name of the magazine from SIGNALS. No action was taken as no name more descriptive of our major interests was suggested. The study indicated rather that SIGNALS is becoming more acceptable as the name and when seen frequently in strategic locations tends to remind one of the importance of *signal* communications in current military operations.

5. Paid Advertising

The number of pages of advertising increased slightly during the year. The effort to encourage local chapters to sell advertising on a 15 percent commission was not a success. In October the firm of Woolf & Elofson, Inc., of New York was engaged on a year's trial basis to sell advertising at a somewhat higher rate per page than before—$200, formerly $150. It is hoped that we may now attain the original objective of 19 pages of advertising in each issue instead of the 12 or 13 pages that have been our maximum.

6. National Headquarters

There are now seven employees, some part time, who handle all of the work in connection with the magazine, circulation and other administrative details. The pay for the month of March totalled $1,367.72, a slight increase over last year because of some salary raises for employees who had been in the office more than one year.

New life member certificates were sent to all life members, new charters to all chapters, and association lapel emblems, medals, binders for the magazine, and membership certificates were obtained and offered for sale.

7. Membership and Circulation

Last year the Board of Directors voted to raise dues to $5 for individuals and $200 for groups. Results have been somewhat disappointing. There has been no substantial increase in individual memberships. Expected action by chapters to recruit members has not developed or shown satisfactory results. Growth expected from broadening our scope to include Navy and Air Force has not yet come up to expectations either, as new Air Force and Navy members had been negligible in number until after the annual meeting in March. Some Signal Corps members have not renewed, as they no longer had the special interest which they had in Army Signal Association. Most of the losses were enlisted members, especially those who have been transferred, discharged or lost interest.

Special publicity in many technical periodicals—Radio News and Telecommunications Reports, for example—has produced some interest. Also weekly mailings to new radio amateurs has been helpful.

Attempts at paid ads in *Air Force* and *QST* were disappointing.

A special "Gary Committee" was formed to make recommendations which it is hoped will increase total members.

Comparison with the Society of American Military Engineers and American Ordnance Association shows we are ahead of them at the end of three years. As they have found, our best method of recruiting is through increased activities by chapters.

The number of subscribers to SIGNALS, by libraries, post exchanges, ship's stores, and other non-members, has on the other hand increased tremendously—about 268 percent. The number of group members also has increased—over 22 percent. It is because of this that our total circulation is about as it was a year ago.

The total paid-up memberships of all classes, including subscriptions, on March 15, 1949, was:

Total	6,059
Full	3,224
Student	709
Life	120
Group	140
Subscriptions	1,108

This total of 6,059 compares with a total of 8,000 in the Society of American Military Engineers after *10 years* of existence and 3,386 in Army Ordnance Association after *9 years*, and is, therefore, considered satisfactory for the first 3 years. Our grand total—active and inactive memberships—on March 15 was 8,540. In one of the other associations, the percent of inactive members was, in 1947, 27 percent of the total.

8. Association Affairs

This year the association through its chapters took the lead in honoring the Signal Corps and its founders 86 years ago. Many chapters held meetings with special programs and speakers. The most ambitious plans were those of the

Baltimore chapter which arranged a nation-wide broadcast of a speech delivered for the Chief Signal Officer on March 3 and for a special telecast featuring Signal Corps accomplishments. We now have made a start on what will be an annual occasion for *all* chapters.

Association emblems, medals and membership certificates have been stocked and placed on sale. A considerable income is expected as soon as the initial cost of dies, etc., has been met.

9. Honor Awards

Action was taken by the Executive Committee to honor certain individuals and groups for their contribution to military preparedness, to the improvement of AFCA, and to stimulate interest in improving the training and readiness of the communications and photographic personnel of the services.

Honor memberships, ex-officio, were presented to Admiral Denfeld, Chief of Naval Operations, whose service sponsored the 1949 annual meeting, and to General Vandenberg, who became Chief of Staff of the Air Force since our last national meeting which was sponsored by the Air Force. Honorary life memberships were given to the incumbent chiefs of communications — Admiral Stone and Generals Akin and Ankenbrandt. Special certificates of merit were presented to:

a. Dr. A. H. Taylor, who retired from Naval civil service during the year, for his outstanding work in the development of radar and many other communications devices.

b. David Sarnoff, for his leadership as the first president of AFCA 1946-49.

c. George R. Call, for his initiative in developing a plan for the better emergency use of radio amateurs and their stations and for presenting the plan to the office of the Secretary of Defense.

d. Frank Wozencraft, for his contributions of legal advice and other suggestions for the benefit and improvement of AFCA during its first three years, 1946-49.

e. For excellence in military training and accomplishments, awards were made to:

Virginia Polytechnic Institute
Clemson Agricultural College
University of Maine
Massachusetts Inst. of Technology
University of Alabama
Oklahoma A & M College
Texas Technological College
University of California
Cornell University
New York University
State College of Washington
Iowa State College
Georgia Institute of Technology
Rutgers University
Michigan State College
A & M College of Texas
Kansas State College

f. For excellence in the study of electronics at:

United States Naval Academy
United States Military Academy

g. For the Chapter of the Year.

10. Books and Services Department

This department exists purely to serve our members, especially those in distant posts and stations. The activities and profits of this department increased materially during the year, due to a considerable extent to the introduction of association emblems for sale to members.

11. Chapters

Many of the chapters have become well established during this third year of our existence. Much has been accomplished by most of them. This is due of course to the initiative and interest of the chapter officers. Several chapters now issue a bulletin to their members. The most elaborate of these is the EUCOM Chapter Bulletin with a cover in color, profusely illustrated and with timely articles by leading figures in the European area. The Baltimore chapter made a determined and attractive offer for the 1949 annual meeting to be held there. It was only after much discussion that National headquarters decided in favor of Washington as the location rather than Baltimore.

Greatest progress was made by the Kentucky chapter, the winner of the Chapter of the Year award, which last year was won by the Far East chapter. Its total membership increased 200% during the year.

The number of chapters was increased from 26 to 32 by the establishment of chapters at Southern California, Louisiana and the Spanish War Veterans and student chapters at Oklahoma A & M, Washington State, and Texas Tech. What was said last year must be repeated this year. The largest percentage of the present membership has been obtained through direct mailings by National Headquarters. The lists of names available for such purposes are now pretty well exhausted. The future growth of AFCA will depend to a larger extent on action by chapters and individual members. Chapters which are already established and active are the finest potential for an expansion of membership. There are thousands of former communications personnel in the chapter areas who have never heard of AFCA. They could be reached through personal contacts and through publicity. The latter should be handled through local organizations—veterans, ARRL, reserves, National Guard and the like—and through the local press, radio, posters, window displays, etc. One of the soundest methods to arouse interest is a program of activities by the chapter. Greater activity by chapters to increase our membership is the most urgent need of our association.

12. Coordinating Committee Armed Forces Association

This committee held regular monthly meetings to discuss problems of common interest to the several associations and to plan the annual Industry-Army Day function. This year this was held at Boston, February 4, with General Bradley and Benjamin Fairless of U. S. Steel as the principal banquet speakers. At other sessions Generals Collins and McAuliffe and Assistant Secretary Gray spoke. The 1950 meeting is scheduled for New Orleans in January.

13. National Advisory Committees

Studies and recommendations on eight special problems submitted during 1947 and 1948 by the services were completed by the committees and selected chapters. In commenting on the work of these committees the Chief Signal Officer stated that "the comments have proved of value to the planning people." The Cleveland chapter study was singled out for special praise. With the formation of special committees within the National Security Resources Board and the Munitions Board for the study of problems pertaining to communications, electronics and photography, those committees will carry the burden of this work. This is already true in certain fields with the result that certain committees of AFCA have been dissolved. Nevertheless, the association's function as an advisor on industrial matters remains, in anticipation of the submission of problems not now anticipated either by industry or the services. On March 14 we were advised by one of the services that they were "studying two other problems with a view to asking the help of your committees." Also, the Industrial College of the Armed Forces was invited to call on our group members for advice, for participation in panels and forums, and for speakers on communications and photography in military matters and in any way in which our members could assist.

14. Special Committees

a. To consider merging all industry-military associations—Colonel W. W. Watts, chairman, General C. E. Snow

and Mr. T. S. Gary members. The recommendations were passed on to the "Gary Committee" for consideration.

b. To prepare a better plan for the use of radio amateurs and their equipment in emergency.

George R. Call, chairman, with George W. Bailey, Captain Neilsen, Major Ralls and Commander Wicks as members, prepared and submitted a detailed plan to the Secretary of Defense, whose office expressed appreciation for our efforts and indicated due consideration will be given to the recommendations.

c. To consider ways and means of increasing the membership and the value of AFCA.

T. S. Gary, chairman, and Fred Lack, A. W. Marriner, W. W. Watts, F. W. Wozencraft, Brig. Gen. T. C. Rives, and the three chiefs of communications —Generals Akin and Ankenbrandt and Admiral Stone—as members, studied the problem exhaustively and recommended increased activities by Chapters to recruit new members, and lessening of our activities in certain phases of industrial mobilization problems. The committee's findings indicated that procedures already in effect for increasing memberships are correct but that we must keep patiently and vigorously at it both at National Headquarters and in the chapters as other associations have done. This was especially true of the comments submitted by the Joint Communications-Electronics Committee of the Joint Chiefs of Staff. This committee, which includes the communications chiefs of the three services, stated that it "whole-heartedly endorsed the purpose of your association," and recommended that our principal efforts be directed "toward obtaining maximum possible membership of individuals having an interest in military signal communications, electronics and photography." The J.C.E.C. stated also that "official dealings of agencies of the government with elements of . . . industries should be conducted through officially sponsored agencies." Further, they stated, "group membership by interested companies is a feature of the association which could well be continued."

d. To study and recommend more effective procedures for the use of private technical schools to train technicians for communications for the services. E. H. Rietzke, as chairman of the committee, is still engaged in the study.

e. Army reorganization. Discussion was had by National Headquarters concerning the place of communications in the command setups in the three services, especially the Army, since a bill was being drafted to provide statutory authority for an organization to replace that covered by the pre-war National Defense Act which otherwise will become effective again June 30. 1949. After mature consideration, it was decided that our Association should take no action in this matter.

f. Use of small businesses in the mobilization of industry. This matter was discussed in great detail at the Boston chapter luncheon during the Industry-Army Day meeting on February 4. It was emphasized that the interpretation of present contract laws varies in the service to the benefit of some and detriment of others. Further discussion of the matter by National Headquarters with the services resulted in a decision to postpone action at the present time. The Air Force states that small business establishments had received nearly half of its contracts, mostly in components for aircraft, and that the proportion would be increased.

g. A question was raised by the New York chapter concerning our editorial policy with SIGNALS. The discussion by the Executive Committee resulted in tabling the proposal to set up a special editorial board of some 20 members to check and pass on all articles to be published.

15. Financial

The statement showing the financial condition of the association as of June 1948, prepared by the auditors, indicated that whereas our assets were $25,433.39, the greater portion of that amount was a liability as unearned income from members who had joined or renewed their memberships. Two more months remain before the end of the Fiscal Year but there appears to be no need to exceed the monthly average expenditures already established. Largely because of numerous economy measures, the greater experience by our office staff, our financial position at the end of March was over $4,000 better than on the same date in 1948. But we do not enjoy the position that most of the older associations occupy with a substantial reserve which would be available in the event adverse economic conditions throughout the country should come about, with the decrease in income which would inevitably result. A study of the advisability of following the lead of one of the other associations in establishing an endowment fund, did not result in favorable action.

16. Annual Meeting

Our second annual meeting, sponsored by the Air Force at Wright Field was equally as successful as the first one—Army-sponsored at Fort Monmouth. The Third Annual Meeting, sponsored by the Navy at Washington, March 28 and 29, 1949, was better attended than its predecessors. Detailed description of the events was published in SIGNALS. Next year's meeting will be sponsored by the Army.

At the annual meeting of the Council and national directors, the following chapters were represented:

Atlanta	Kentucky
Baltimore	Louisiana
Boston	New York
Chicago	Philadelphia
Dallas	Pittsburgh
Decatur, Ill.	Richmond
Ft. Monmouth	St. Louis
San Francisco	Washington, D.C.

President David Sarnoff presided. The following action was taken:

a. Elected the officers and directors whose names in paragraph 2 supra.

b. Amended Article II of our constitution so that active duty officers of the services may be elected to be national officers of our association but not to receive pay for any such service.

c. To continue the present membership rates but to permit group members paying $200 annually to name 10 individuals for free membership in the association.

d. Acted on the recommendations of the Gary committee. Since the principal recommendation was that greater influence and increased membership depended upon the activities of the several chapters, there was a lively discussion concerning the future of AFCA, how individuals might be interested in it, whether the purposes and objectives should be changed. Details of this discussion, which was continued in the special panel on chapters which followed, may be found in the account of the meeting, published in SIGNALS for May-June, 1949.

17. Conclusion

In our annual report last year, statements were made about our position as an aid to military preparedness which well might be repeated as they are no less applicable this year.

We, in the military services, have felt the need of a professional association like AFCA for many years, especially immediately before and during World War II. Our objectives appear almost limitless in their possibilities—all adding up to objectives that will contribute to the good of our country. Military strength in this era of total war means more than trained fighting men—it includes industrial readiness and economic strength. World War II taught that war requires technological resourcefulness which means our military leaders must consider now every field of knowledge—politics, history, science. This association, and those of the other branches of the Armed Forces have as one of their most important reasons for existence continued improvement in civilian-military coordination to insure the most effective use of manpower, productive capacity and the evaluation of priorities.

For the President and Board of Directors

S. H. SHERRILL
Brig. Gen., U.S.A. (Ret.)
Executive Director

Chapter News

National Director of Chapters: **Theodore S. Gary, 1033 W. Van Buren St., Chicago, Ill.**

AREA REPRESENTATIVES FOR CHAPTERS

Area A: **George P. Dixon, IT&T Corp., 67 Broad St., New York, N. Y. New England States, New York, New Jersey**

Area B: **J. H. LaBrum, Packard Building, Philadelphia, Pa. Delaware, Kentucky, Maryland, Ohio, Pennsylvania, West Virginia and Virginia**

Area C: **W. H. Mansfield, So. Bell T&T Co., Atlanta Ga. Southeastern States along Atlantic and Gulf coasts—from North Carolina to Mississippi and including Tennessee**

Area D: **H. L. Reynolds, 1800 N. Market St., Dallas, Tex. New Mexico, Texas, Oklahoma, Arkansas and Louisiana**

Area F: **H. L. Hoffman, 3761 S. Hill St., Los Angeles, Calif. Arizona, Utah, Nevada, California, Idaho, Oregon, Montana and Washington**

Individuals interested in chapter activities should communicate either directly with National Headquarters or with the proper area representative.

CHAPTERS AND SECRETARIES

ATLANTA: **Capt. Dewey Allread, Jr., Bldg. 104, Apt. 1, Ft. McPherson, Ga.**

AUGUSTA-CAMP GORDON: **Maj. Nell Farnham, SCTC, Camp Gordon, Ga.**

BALTIMORE: **E. D. Bond, Baltimore Signal Depot, Middle River, Md.**

BOSTON: **Edmund T. Bullock, Boston Army Base, Boston 10, Mass.**

CHICAGO: **Raymond K. Fried, 111 W. Monroe St., Chicago 1, Ill.**

CLEVELAND: **H. E. Schafer, Radiart Corp., 3751 W. 62nd St., Cleveland 2, Ohio.**

DALLAS: **E. H. Mittanck, Rm. 816, Telephone Bldg., Dallas, Tex.**

DAYTON: **Gertrude A. Knight, 54 Patterson Village Dr., Dayton, Ohio.**

DECATUR: **Doris E. Short, 140 No. Hilton St., Decatur, Ill.**

EUROPEAN: **C. E. Laurendine, Comm. Gp., BiPartite Control Office, Frankfurt, APO 757, New York.**

FAR EAST: **C. B. Whittenberg, Sig. Sec., GHQ., FEC, APO 500, c/o PM, San Francisco, Calif.**

FORT MONMOUTH: **Maj. T. J. Palik, Tng Div., T.S.S., Ft. Monmouth, N.J.**

KENTUCKY: **Clyde T. Burke, Lexington Signal Depot, Lexington, Ky.**

LOUISIANA: **A. Bruce Hay, Southern Bell Tel. & Tel. Co., New Orleans, La.**

NEW YORK: **William H. Harrington, 195 Broadway, New York 7, N. Y.**

OGDEN-SALT LAKE: **Miss Marjorie Hansen, 2227 Adams Ave, Ogden, Utah.**

PHILADELPHIA: **Joseph Bergman, Sig. Corps Stock Control Agency, 2800 So. 20th St., Philadelphia, Pa.**

PITTSBURGH: **K. A. Taylor, Bell Telephone Co., 416 7th Ave., Pittsburgh, Pa.**

RICHMOND: **Lelia V. Fussell, Ches. & Potomac Tel. Co., 703 E. Grace St., Richmond, Va.**

RIO: **Huston Maxwell, JBUSMC, APO 676, c/o PM, Miami, Fla.**

SACRAMENTO: **Maj. James A. Board, Sacramento Signal Depot, Sacramento, Calif.**

SAN FRANCISCO: **J. K. Fairchild, 55 Madrone, Fairfax, Calif.**

ST. LOUIS: **A. Reid Chappell, 70 York Drive, Brentwood, Mo.**

SEATTLE: **Clarence C. Bodine, 6812 Phinney Av., Seattle, Wash.**

SOUTH CAROLINA: **Lt. Geo. A. Frakas, Post Sig. Off., Hqrs., Fort Jackson, S. C.**

SOUTHERN CALIFORNIA: **K. E. Lambert, MGM, Hollywood, Calif.**

SPANISH WAR VETERANS DIVISION: **George A. Marshall, Adj., 215 Montague St., Brooklyn, N. Y.**

WASHINGTON: **Edward C. Cover, Chesapeake & Potomac Tel. Co., 725 - 13th Street, N. W., Washington, D. C.**

STUDENT CHAPTERS

CORNELL: **John M. Ross, 126 McFaddin Hall, Ithaca, N. Y.**

NEW YORK UNIVERSITY: **Robert D. Hawkins, 25 Spruce Ave., Ridgefield Park, N. J.**

OKLAHOMA A & M: **W. D. Manahan, Okla. A & M College, Stillwater, Okla.**

STATE COLLEGE OF WASHINGTON: **Stuart W. McElhenny, 604 California St., Pullman, Wash.**

TEXAS TECH: **Raymond D. Self, Veterans Village, Lubbock, Tex.**

UNIVERSITY OF CALIFORNIA: **R. G. Barhite, Bowles Hall, U. of Calif., Berkeley, Calif.**

NATIONAL HEADQUARTERS CHAPTERS SECRETARY: JULIA B. GODFREY

Chapter Of The Year, 1949

KENTUCKY

President—Murray P. McQuown

Past Pres.—William M. Mack

Secretary—Clyde T. Burke

Atlanta—D. A. McKeever, Pres.

On April 18th, the officers and directors of the chapter met at a luncheon at the Athletic Club to hear the National Executive Director, Brig. Gen. S. H. Sherrill, describe the activities at the annual meeting in Washington, March 28 and 29. Chapter President Dan McKeever presided and introduced Maj. Gen. E. W. Smith, commander of the 108th Airborne Division, Organized Reserves; W. H. Mansfield, Area C representative of AFCA; James Bonner, Southern Bell Telephone Co.; and Col. Charles Olin, Signal Officer Third Army. General Sherrill paid tribute to the South as a bulwark of our country in its war against communism in the United States and emphasized the great need for a strong association to ensure the best in communications, electronics and photography in our armed forces. He spoke of the findings of the Gary Committee in its study of means to increase AFCA influence and membership, and complimented the Atlanta Chapter on its aggressive membership campaign of the past year.

At the regular meeting on May 11th, Maj. Gen. F. L. Ankenbrandt, Director of Air Force Communications, was the honor guest together with Col. George W. Goddard, Air Force photography expert, who demonstrated the three-dimension color strip photography which was a feature of the AFCA 1948 national meeting at Wright Field.

Augusta—Camp Gordon—H. A. Fleming, Pres.

The charter for this new chapter—the 33rd—was formally presented by Brig. Gen. S. H. Sherrill, National Executive Director, at the chapter's first dinner meeting, April 19th, at the Officers' Club, Camp Gordon. Col. Harold Osborne presided. He introduced Maj. Gen. Spencer B. Akin, Chief Signal Officer of the Army, who spoke briefly about AFCA and its objectives, especially as a means of further unifying the communications activities in the three services. Mr. W. H. Mansfield, AFCA area representative who came over from Atlanta, congratulated the chapter and offered the services of the Atlanta chapter in its organizational work.

General Sherrill, in presenting the charter, outlined the activities of the association since its formation and of various chapters which were competitors in the annual Chapter of the Year contest. He paid tribute to the splendid work for national defense of Georgia's veteran Congressman, Carl Vinson, chairman of the House Armed Services Committee, and urged his fellow Georgians to follow his lead in supporting military appropriations and other legislation which would make America strong, especially in communications and electronics.

The following were chosen as interim officers of the chapter: honorary president—M. S. Symms; Southern Bell Telephone Co.; president—H. A. Fleming, Southern Bell Telephone Co.; vice president—F. A. Saxon, Georgia Power Company; honorary secretary-treasurer — Maj. Norman J. Kinley, Camp Gordon; Secretary-Treasurer—Maj. Nell Farnham, Camp Gordon.

It was agreed that meetings would be held at 7:30 P.M. on the third Wednesday of each month, to alternate between Camp Gordon and Augusta.

Chicago—O. Read, Pres.

The Chicago chapter held a meeting on May 20th for the purpose of reorganizing and planning chapter activities. The chapter has been inactive for over two years and Oliver Read, acting chapter president, and J. S. Gary, national director in charge of chapters, arranged the meeting. Speakers included Admiral Earl E. Stone, Chief of Naval Communications, Fred Lack, president-elect of AFCA, Mr. Gary and Brig. Gen. S. H. Sherrill, National Executive Director.

Details of the meeting will appear in the next issue.

Cleveland—L. J. Shaffer, Pres.

The Cleveland Life Boat Station of the United States Coast Guard was the scene of the April 14th meeting of the Cleveland chapter. The meeting was devoted to an inspection of communication facilities and electronic applications, including radio beacons and remote control facilities, as used in the varied services furnished by the Coast Guard.

Detroit

An organizational meeting to establish a chapter in Detroit was held on May 19th. Some 100 representatives of communications and photography were present, including officials from Selfridge Field, the local radio stations, General Motors and Ford Motor Co., Western Union, and the Michigan Bell Telephone Co. Mr. George T. Jeffers of Michigan Bell made the arrangements for the meeting. Brig. Gen. S. H. Sherrill, AFCA Executive Director, came from Washington to outline the procedures to follow in establishing the chapter. Details of the meeting will appear in the next issue.

European—M. M. Newcomer, Pres.

The Spring Convention of the European Chapter was held in Frankfurt on April 30th. The guest speaker was Maj. Gen. R. W. Douglas, Jr., Air Force Chief of Staff, USAFE. He congratulated the chapter on its activities under the severe handicaps which exist in the European Theater. He stated that thirty per cent of the Air Force was engaged in communications work and described the communication systems in use at the flight service centers. In discussing the Ground Control Approach, he said, "During the month of January, we made approximately 204,000 landings under adverse situations. We had a plane either landing or taking off in Berlin on Good Friday about every 33 seconds. That day was set up not as any 'particular' day but to run a test on our communication

THE WINNER — KENTUCKY

The Kentucky Chapter went over the top with 35.5 points to win the second annual "Chapter of the Year" contest. New York placed second with 27.0 points; Atlanta was third with 19.7 points; Cleveland was fourth with 19.3 points; and Baltimore placed fifth with 18.0 points.

The main factors contributing to Kentucky's success were: over 200% added in new members, and eight interesting, well attended meetings. This was the greatest number of meetings held by any chapter. Kentucky and New York were equal on renewals—each having renewed two-thirds of their membership. Both chapters were equally outstanding in the thoroughness of their reports to national headquarters. Advance notices were sent on all meetings, followed up by prompt accounts of the proceedings.

Since no changes in the rules governing the contest were recommended at the chapters meeting in Washington, it is assumed that the same rules will apply to the 1950 contest which began on May 1st. They are:

1. **Each meeting held from May 1, 1949 to April 30, 1950—1 point.**
2. **Percentage of active strength as of May 1, 1949, that has been added in new members, multiplied by 5.**
3. **Percentage of renewals from May 1, 1949 to April 30, 1950, multiplied by 10.**
4. **In addition, consideration will be given to the following:**
   a. **Type of programs presented at meetings. (New York was awarded extra points for its February meeting which featured the three Chiefs of Communications.)**
   b. **Chapter publications. (The European Chapter was awarded extra points for its outstanding "Review." Kentucky and Richmond were also given credit for their bulletins.)**
   c. **Action taken to increase interest in military preparedness. (Atlanta received extra points for its award to an ROTC student at Georgia Tech. Baltimore was given credit for its broadcast of Gen Akin's address on Signal Corps day.)**
   d. **Completeness of reports of activities to national headquarters. (Kentucky and New York were given equal points for excellent reports.)**

WHEN DOES YOUR MEMBERSHIP EXPIRE?

LOOK AT THE EXPIRATION DATE ON YOUR MEMBERSHIP CARD. IF IT IS WITHIN 30 DAYS, IT'S TIME TO PAY YOUR DUES. FILL IN THE LOOSE FORM INSERTED IN THIS COPY AND RETURN WITH THE CORRECT REMITTANCE. IF YOU DO NOT USE THIS FORM PLEASE PASS IT ON TO A FRIEND FOR HIS USE IN MAKING APPLICATION.

systems. It was to see whether or not our radio aids were working properly and radar in Berlin could handle the traffic—and everything worked perfectly. . . . . Communications has grown every bit as fast as the Air Force. When new requirements go forth, commercial or military experts in the signal game keep ahead. We cannot operate without these facilities which we are so used to depending on."

After reports from the various committees and sub-chapters, the annual election of officers was held. The result was as follows: president —Martin M. Newcomer, Representative of The Western Union Telegraph Co. in Germany; vice president—Lt. Col. Steve J. Gadler, USAFE, Chief, Electronic Supply; executive secretary—Chase E. Laurendine, retiring chapter president, Communications Group, Bi-Partite Control Office, Frankfurt; treasurer—Capt. Winston Williams, OIC, Communications Center, ASA, Frankfurt; counsel—Lt. Col. R. W. White, Administrative Officer, OCSigO, Heidelberg.

At the conclusion of the meeting, the members participated in two scheduled tours—one to the Rhein-Main to see GCA in action, and the other to the air traffic control center in Frankfurt.

Fort Monmouth—L. J. Tatom, Pres.

At a recent election, the following slate of officers was chosen: president—Col. Louis J. Tatom; first vice-president — Dr. Harold A. Zahl; second vice-president—Lt. Col. Wesley R. Herrlein; secretary—Maj. T. J. Palik. Dr. Zahl and Mr. W. L. Seibert were designated National Council representatives.

Kentucky—M. P. McQuown, Pres.

1949 Chapter of the Year

A fund-raising meeting was held at the Lexington Signal Depot Officers' Club on March 11th. Approximately 65 members and guests were present. The meeting was called to order after supper. At the conclusion of the business session, a program of entertainment was furnished by several versatile members. Donald Freeman played the accordion and piano; Clayton Cannon performed some novelty dance routines: and Charles

Kentucky Chapter President M. P. McQuown (right), and past-president W. M. Mack.

Schlegel gave several vocal numbers. This was followed by an auction of "white elephant" articles. All members had been required to bring an article of value. The auction was successful and a considerable amount of money was raised to replenish the chapter treasury. Additional money was raised by the sale of individual photographs taken of the members by Clyde Burke, amateur photographer and chapter secretary. The Signal Corps film, "Attack, Battle for New Britain," concluded the program.

The April 8th meeting was held in the lobby of the Lexington Telephone Company's new building. After a brief business meeting, Vice-President Harry Bradshaw reported on President McQuown's trip to Washington for the third annual AFCA convention.

A demonstration of the Lexington Telephone Company's new dial system was then presented by George J. Brims, representative of the Federal Telephone & Radio Corporation of Clifton, N. J.

Louisiana—H. B. Lackey, Pres.

The charter of the Louisiana Chapter was formally presented by Rear Admiral Earl E. Stone, Chief of Naval Communications, at a luncheon meeting at the Jung Hotel, New Orleans, on March 15th. Some 75 members were present.

In his address to the chapter, which was broadcast locally, Admiral Stone said it was his personal opinion that the communications branches of the three services were leading all others in coordination under the unification of the armed forces. He described what is being done by the Joint Communications - Electronics Committee and that, as a result, the facilities of each service are being made more readily available to the other services. He cited the Berlin air lift as a good peacetime example of mutual support on the part of all three branches of the armed services. "It is truly an inspiring illustration of how two services—the Army and the Navy—can and are supporting the Air Force which is assigned the primary responsibility for accomplishing the task," he said.

The charter was presented to the interim president of the chapter, Harry B. Lackey, District Manager of the Southern Bell Telephone & Telegraph Company.

New York—G. P. Dixon, Pres.

The March meeting of the New York Chapter was held at the Officers' Club on Governors Island and commemorated the 86th anniversary of the founding of the Signal Corps. The guest of honor was Maj. Gen. Francis H. Lanahan, Commanding General at Fort Monmouth.

In honor of the occasion, President Dixon presented a pictorial history of the Signal Corps from its pre-Civil War Days to and including World War II. Photographs obtained from the archives of the Army Pictorial Service were projected by slides prepared especially for the meeting through the cooperation of Col. W. W. Jervey.

The program for the April 28th meeting was sponsored by the Air Force members of the chapter. Due to unforeseen circumstances, General Gordon Saville, Commanding General of the Air Force Defense Command at Mitchel Field, who had been scheduled to speak, was detained in Washington and could not be present. Col. Hobart Yeager, Director of Communications and Electronics of the Continental Air Command, acted as a pinch-hitter for General Saville and gave a very interesting description of the organization of the Command and its communications problems. He also presented an unusual motion picture dealing with atomic energy, called "God and the Atomic Bomb."

Col. John A. Hartman, USAFR, discussed the plans and functions of the AFCA as applied to the Air Force membership and urged all eligible personnel to join the New York chapter. Fred R. Lack, national President-elect of AFCA, followed with an informal talk on the events of the recent annual AFCA convention in Washington.

Between dinner courses, the chapter president called for a few remarks from several members, including Capt. Roy Graham, USN, Chief of Communications, Eastern Sea Frontier; Lt. Col. Robert McKithan, Asst. Signal Officer of the First Army; and Lt. Col. Frank Fay, former secretary of the New York chapter. Wallace Figal, Managing Editor of SIGNALS, was present as a representative of AFCA national headquarters and General Sherrill, and brought greetings from Washington.

After the dinner, a testimonial scroll was presented to Col. George Dixon who recently retired from the active Reserve after 33 years of Army communications service. The scroll, containing many signatures, was presented by Col. W. H. Harrington, chapter secretary, on behalf of those who had served with Col. Dixon at various times during his military career. The meeting closed with several anecdotes by Capt. Kenneth McKim concerning his recollections of Mexican Border and World War I days when he saw service with Col. Dixon.

The Philadelphia Chapter held a meeting at the Philadelphia Navy Yard in April. After a dinner at the officers' club the members toured the yard to inspect shipboard communications equipment.

Philadelphia—W. W. Watts, Pres.

A dinner-meeting to commemorate the Signal Corps anniversary was held on March 3rd at the Officers' Club at the Philadelphia Quartermaster Depot. After dinner, the results of the recent election of officers were announced as follows: W. W. Watts of RCA Victor was re-elected president; William H. Knowles of International Resistance Co. was elected 1st vice president; L. J. Woods of Philco Corp. was elected 2nd vice president; Joseph Bergman of the Signal Corps Stock Control Agency re-elected secretary; and W. F. Denkhaus of Bell Telephone re-elected treasurer.

After introducing the distinguished guests, President Watts called on Col. Benjamin Stern, head of the Signal Corps Procurement Agency, who outlined the assistance which he thought AFCA could give to his activity. Brig. Gen., S. H. Sherrill, National Executive Director, spoke briefly on the activities of other chapters. Col. A. M. Shearer, Deputy Chief of Procurement and Distribution Service, OCSigo, was the principal speaker and outlined the history of the Signal Corps since it was formed in 1862 by Col. Myer.

The chapter has launched a campaign to bring about greater understanding and cooperation between members of the armed forces and the communications industry in its area. The first of a series of meetings in line with this objective was held on April 19th at the Philadelphia Navy Yard. More than fifty persons attended a dinner at the Officers' Club and then toured the Navy Yard to inspect shipboard communications equipment.

Pittsburgh—F. E. Lieb, Pres.

Chapter members attended a meeting of the Institute of Radio Engineers on March 14th at the Mellon Institute Auditorium. Mr. R. E. Stark, Vice-President of the Stupakoff Ceramic & Manufacturing Company (a group member of AFCA) spoke on "Ceramics that Talk."

The regular monthly meeting of the chapter was held on April 12th in the Basement Auditorium of the Bell Telephone Building. Further consideration was given to problems submitted by the National Advisory Committee. Subjects and discussion leaders were: "Reduction of Time between Experimental and Production Models of Communications Equipment"—Lt. Col. E. N. Wells, Bell Telephone Co. of Pa.; "Evaluation of Production Capacity by a Unit other than the Dollar"—Lt. C. A. McKenney, Jr., Peoples First National Bank & Trust Co.

Mr. D. L. Chaffee, Engineer, Copperweld Steel Company, reviewed the AFCA annual meeting held in Washington.

Refreshments and a general discussion session followed the meeting.

Richmond—E. T. Maben, Pres.

The Richmond chapter wound up its activities for the season with a dinner meeting at Ewart's Cafeteria on April 26th. Photography was the theme of the program. Mr. G. Alexander Roberson, Chairman of the Photographic Committee of the National Speleological Society, guest speaker, gave an illustrated talk on "Spelunking (Cave Exploring) as a Hobby."

Sacramento—L. J. Brundige, Pres.

The March 16th meeting of the Sacramento chapter featured a talk by Mr. Gordon A. Stevens of the Eastman Kodak Company. Mr. Stevens discussed the latest developments in high speed motion photography and the Di-transfer Process used in processing and printing color negatives.

Prior to the meeting, chapter members and their guests from the Woodland Camera Forum and the Sierra and Sacramento Signal Depot Camera Clubs viewed an exhibit of aerial photographic equipment.

A tour of the Sacramento Signal Depot is being planned for the June meeting.

St. Louis—C. P. Bobe, Pres.

Chapter members and guests attended a dinner meeting on March 21st in the Victoria Room of Caravelli's Restaurant. After dinner a short busines meeting was held. The program was arranged by the Southwestern Bell Telephone Company and consisted of three sound movies—"Trouble Underground," "The Telephone Hour" and "Stepping Along with Television."

CHAPTER NEWS

Seattle—M. F. Kerr, Pres.

Forty-one members attended the April 12th meeting at the American Legion Hall. President Kerr discussed the campaign being conducted to publicize AFCA and increase its membership in the Seattle area.

Mr. Marshall B. James, entertainment chairman, spoke on the many uses of titanium and the important place this metal will take in the world markets in the next few years.

A technical lecture was given by Maj. F. J. Werthmann, covering diversity receivers, frequency shift circuits, filters, multiplex mixer amplifiers, triple diversity, teletype circuits and use of keying CW on voice transmissions.

The June meeting of the chapter will feature a tour of the Naval Reserve Communications facilities at Lake Union Armory.

South Carolina—J. M. McAlister, Pres.

At a dinner meeting at the Fort Jackson Officers' Club on April 20th the foundation was laid for AFCA's newest chapter—South Carolina. Arrangements were made by Col. Fred Fister of the South Carolina division of the Southern Bell T&T Co. Over one hundred were present, with a large delegation from Charleston, headed by Capt. R. E. Melling, USN, Naval District communications officer; and a group from the Greenville Air Force Base headed by Lt. L. W. Lansdowne.

The honor guest was Maj. Gen. G. H. Decker, Commanding General of the 5th Division and Fort Jackson, who spoke briefly of his experience with communications and his opinion of our association's mission as an instrument of military preparedness. Mr. Ralph S. Grist, of Atlanta, representing AFCA's area representative Wm. H. Mansfield, discussed the progress made in establishing chapters in the South. He then introduced Brig. Gen. S. H. Sherrill, National Executive Director, who had come from Washington to describe the activities and purposes of AFCA and the procedures to follow in forming a chapter. Gen. Sherrill suggested that the South Carolina chapter might have three divisions, each of which would hold one meeting a year, similar to the national meeting, at which one service would be host.

The following were chosen as interim officers to take immediate action toward increasing the chapter's membership and organizing committees to plan a worthwhile program of activities: president—J. M. McAlister, Southern Bell, Columbia; vice presidents—J. L. H. Young, Southern Bell, Charleston; Capt. R. E. Melling, USN, Charleston; Lt. L. W. Lansdowne, Greenville Air Force Base; secretary— Lt. George A. Frakas, Fort Jackson.

Spanish War Veterans Division—G. A. Marshall, Adj.

The 49th annual reunion of the Spanish War Division of the U. S. Veteran Signal Corps Association, which is an honorary chapter of AFCA, was held at the Hotel Victoria in New York on April 30th. Col. George Dixon, President of the New York Chapter, represented AFCA at the luncheon and extended the best wishes of the asociation.

Southern California—H. W. Hitchcock, Pres.

The March meeting was addressed by Dr. I. H. Swift of the Naval Ordnance Test Station at Inyokern. He gave the audience an excellent picture of how analog computers operate and demonstrated them in the form of two simulated airplanes, in one of which was a simulated gunsight.

Lt. Col. H. W. O. Kinnard, USA, Director of the Airborne Service Test Section of Army Field Forces Board No. 1, Fort Bragg, N. C., addressed the May 12th meeting on "Airborne Operations, Past, Present and Future." Col. Kinnard was well qualified to present this subject. During the war he was a member of the 101st Airborne Division, and since that time has been one of the group principally responsible for developments in this field. He is temporarily in Southern California as technical advisor on a motion picture pertaining to airborne operations.

Due to arrangements made with local authorities, Army and Air Force Reserve personnel receive point credit for attendance at the Southern California chapter meetings.

New York Chapter President George Dixon receives testimonial scroll and is congratulated by Lt. Col. Robert McKithan, Assistant Signal Officer of the First Army. Between them is Col. Hobart Yeager, Director of Communications and Electronics of the Continental Air Command, and Capt. Roy Graham, USN, Chief of Communications, Eastern Sea Frontier.

Washington, D. C.—F. G. Macarow, Pres.

With the chores of the AFCA's national meeting in Washington accomplished and out of the way, the Washington chapter has turned its attention to local affairs. Its annual election of officers has approached, and by SIGNALS' next issue the results will be known for publication.

Only one who has worked on preparations for a national convention can fully appreciate the labors of certain of the Washington chapter members in arranging for the reception of the AFCA members at the recent national meeting.

Outstanding in the month or two of pre-meeting ceaseless work on arrangements were the efforts of the local chapter secretary Edward Cover, E. Goring Bliss, and Betty Norris.

Handling all of the reservations for the convention, Julia Godfrey, chapters secretary for AFCA National Headquarters, also worked long extra hours and days for several weeks before the convention.

STUDENT CHAPTERS

Texas Tech.—Rex Brown, Pres.

The Texas Tech chapter celebrated the 86th anniversary of the Signal Corps with a birthday dinner at the Hilton Hotel, Lubbock, on March 3rd. All student members and Signal Reserves were invited to attend. The current officers of the chapter are president—Rex Brown; 1st vice-president—Nolon C. Rhodes; 2nd vice president—Lloyd E. Walrath; secretary—Raymond D. Self; treasurer—F. H. Wolf.

EXERCISE MICOWEX

Communications During the Joint Cold Weather Exercise At Kodiak, Alaska

Article Prepared for SIGNALS

By Alaskan Command Headquarters

As part of the Armed Forces peacetime training program, the Army, Navy, and Air Force participated in a joint minor cold weather exercise (MICOWEX) at and near Kodiak Island, Alaska, in January and February, 1949. Planned as a test of equipment, operations and tactics in the sub-Arctic, the exercise provided excellent experience with communications in and near the auroral absorption zone.

Early Planning Effected

As in all operations, and particularly in joint operations, it was again demonstrated that early planning is necessary and that communication planning must start at the outset along with all other planning. Seldom, if ever have communicators felt that they have been included in the planning early enough, but in this exercise the gaps in communication planning were quickly recognized and corrected.

The Army's communications included the provision and operation of fixed point-to-point communication facilities within Alaska, and a few tactical circuits in connection with the base defenses of Kodiak.

Navy Station Funnels Traffic

The Navy's communications included ship-to-shore, ship-to-ship, air-to-ship and air-to-ground facilities, handling administrative, operational and command traffic. The Naval Communication station at Kodiak served as a focal point, or funnel, through which most of the traffic to and from the ships and aircraft was passed. All types of radio were used, including fixed, mobile, and portable installations, as well as radio teletype and VHF phone. The Navy Headquarters at Kodiak and the Air Force Headquarters at Fort Richardson, a distance of about 300 miles, were linked by radio teletype and VHF telephone, provided by the Alaska Communication System of the Army.

Intercept Service

The Air Force communications included ground-to-ground and ground-to-air facilities, handling operational and command traffic. A monitoring intercept service was maintained for the "white" Air Force strike group commander to intercept reports from naval search and patrol aircraft, as well as strike and position reports from the striking B-29's. All of the information obtained was posted in the commander's "air room," so that up-to-the-minute information was available to enable the strike group commander to alert and direct his B-29 aircraft for strikes on the hostile "blue" task force carrier group.

Radar and Optical Photos

On the strikes carried out against the "blue" carrier task group, the B-29's transmitted and received reports enroute to the target area, receiving changes in the position of the target until they were able to pick up the carrier task group with aircraft radar. Radar scope photographs taken at timed intervals provided an accurate record of the bomb runs. In addition, optical photographs were taken when breaks in the overcast made this possible.

Radar was operated successfully by both the Navy and the Air Force for air and surface search and intercept work. The ground controlled intercept equipment was transported from Elmendorf Air Force Base to a site near Kodiak Naval Operating Base. The Air Force installed this transportable equipment in a World War II radar coastal defense site. The ground controlled intercept furnished by the Air Force was termed "most effective." Air Force F-80 aircraft, based at Kodiak, were vectored to intercept all unidentified aircraft approaching Kodiak. After the B-29 strikes on the naval carrier task group, "blue" aircraft were dispatched from the carriers for a strike on Kodiak. GCI picked up the enemy aircraft over 100 miles from Kodiak and the F-80's were scrambled. During this phase the enemy fighters dropped "window" in an attempt to confuse the ground controlled intercept.

Auroral Interference Minor

Although much has been said about the effect on communications of operations in and near the auroral absorption zone, the use of normal radio frequencies was not affected at the distances required by this exercise, with one exception. Ionospheric disturbances were held responsible for communication failure on one circuit for a period of two hours. The exercise did demonstrate, however, the advantage of having more than one ground station prepared to receive and relay aircraft radio reports.

Highlighted in this exercise was the fact that the armed forces can work together in the communications field. Minor differences in techniques did not present any insurmountable problems. Great benefit was derived by all concerned from this experience in working together, including confidence in our ability to communicate in Sub-Arctic regions.

NEWS—SERVICES and INDUSTRY

General

Munitions Board Reports to Congress

The nation's industrial plant and equipment reserve, maintained by the government as a security measure, now consists of 236 manufacturing facilities along with thousands of machine tools and production equipment items, the Munitions Board reported to Congress on March 31st on behalf of Secretary of Defense Louis Johnson.

Facilities held in the national industrial plant reserve were built with Federal funds during World War II at an original acquisition cost of about $2,300,000,000 after deduction of parts not needed or already sold or removed, according to the Board's report covering actions under Public Law 883, 80th Congress.

In addition to facilities covered by the report, about 150 World War II plants are held in military reserve and over 500 others have been sold or leased and are still producing essential wartime products, all of them built with Federal financial aid.

Contained in the report were initial recommendations of the National Industrial Reserve Review Committee, organized in January, which tentatively favored retention in the reserve of all but a scattered few of the 236 facilities held on February 28, 1949.

The government's reserve nucleus, created for use in the event or in anticipation of a national emergency, comprises facilities leased, sold, or held for sale under stipulation that they be maintained under a national security clause to insure their readiness for reconversion to war production. Machine tools and industrial production equipment are stored for similar emergency use.

Facilities are grouped into 15 categories of industrial activity: aircraft, chemicals, coal and petroleum products, explosives and ammunition loading, food processing, guns and ammunition, iron and steel, machine tools, machinery and electrical, motorized vehicles, nonferrous metals, shipbuilding, synthetic rubber and components, miscellaneous manufacturing and miscellaneous nonmanufacturing.

Standardization Study Asked

The National Security Resources Board has asked leaders of the communications industry to study the problem of standardizing the radio, telegraph and telephone equipment used by the various armed forces.

The question was raised at a meeting of 31 industry representatives, military officials and civilian government agency spokesmen who were called together by the board to help draw up mobilization plans for any future M-day.

Speakers representing the industry included: K. S. McHugh, financial vice-president of the American Telephone and Telegraph Company, speaking for the Bell System; H. V. Bozell, president of the General Telephone Corporation, speaking for the independent telephone companies; and Adm. J. R. Redman, vice pres. of the Western Union Telegraph Company, speaking for the telegraphic communications industry.

Members of the Advisory Committee include the following from AFCA groups:

H. V. Bozell, president, General Telephone Corporation, NYC.
G. K. McCorkle, president, Illinois Bell Telephone Company, Chicago, Illinois.
W. D. Gillen, vice president, The Bell Company of Penna., Philadelphia, Pa.
H. T. Killingsworth, general manager, Long Lines Department, American Telephone & Telegraph Co., N.Y.C.
J. R. Redman, vice president and E. R. Wheeler, general purchasing agent, Western Union Telegraph Company, N.Y.C.
K. S. McHugh, vice president and J. B. Rees, assistant chief engineer, American Telephone & Telegraph Co., N.Y.C.
R. A. Phillips, president, Central Telephone Company, Lincoln, Nebr.
Robert E. Shotts, vice president, Telephone Services, Inc., Chicago, Ill.

Military Contract Renegotiation Forms

Forms to be used in military contract renegotiation proceedings are given in Part 427 of Military Renegotiation Regulations made public recently by the National Military Establishment.

Contractors having gross receipts of $100,000 or more from military business which is subject to renegotiation are required to file a "Standard Form of Contractor's Report." When this form is received, a finding will be made as to whether renegotiation proceedings are necessary.

The regulations require the standard form to be filed on or before the last day of the fifth month following the close of the contractor's fiscal year. Because the date has already passed in some cases, the Military Renegotiation Policy and Review Board has extended to July 31, 1949, the time for filing for contractors whose fiscal year ended between May 21, 1948, and January 31, 1949.

Additional reports required of contractors are specified in Part 427, prepared by the Military Renegotiation Policy and Review Board. The board is composed of representatives of the Army, Navy, and Air Force.

The full text was published in the Federal Register of April 19, which may be obtained from the Superintendent of Documents, Government Printing Office.

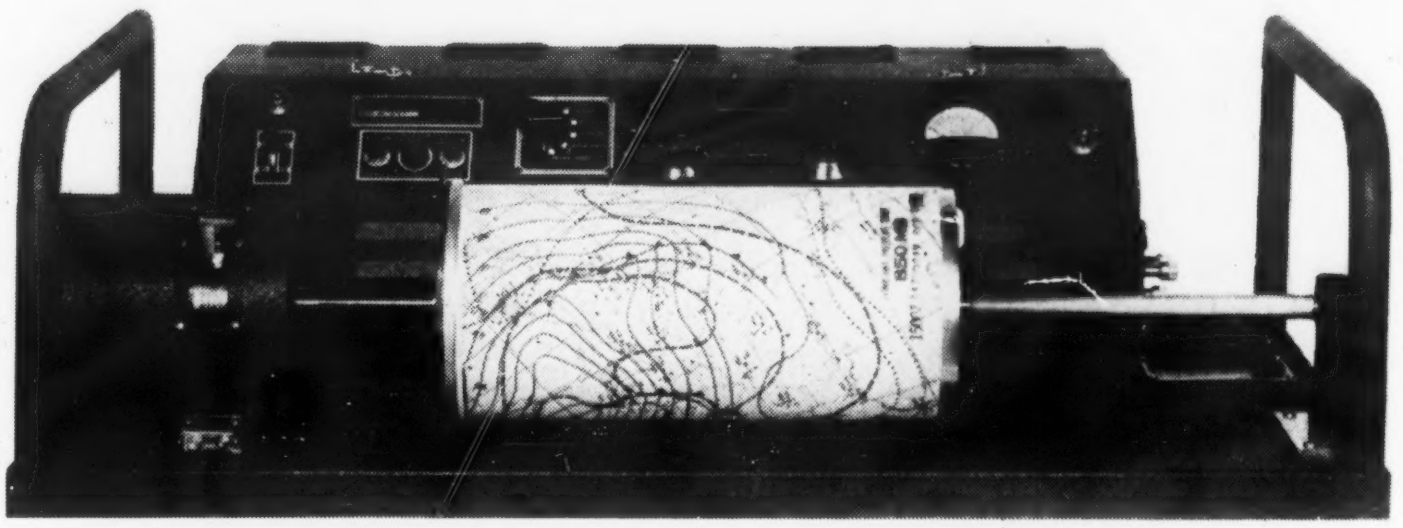
Standards Agency Reorganized

Under the terms of a new charter recently signed by the assistant secretaries of the three military services, the government body organized in December, 1943 as the Army-Navy Electronic Standards Agency has been reconstituted as the "Armed Services Electro Standards Agency." The change provides for official participation by the Air Force, which became a separate component of the National Military Establishment under the provisions of the National Security Act of 1947.

Employing 126 persons, the Agency occupies five buildings just outside the main area of Fort Monmouth, N. J., near the Signal Corps Engineering Laboratories. Sales and technical representatives of radio-electronics manufacturers are welcome to visit the Agency at any time, according to its officials, to obtain first-hand information on the work it is doing. The co-directors of the Agency are Colonel Louis J. Tatom, Signal Corps (president of AFCA's

TIMES FACSIMILE EQUIPMENT

Used on the Weather Bureau—
Air Forces-Navy (WBAFN) Network
for the distribution of Weather Maps
and Charts over wire-line circuits
throughout the United States.



MODEL TXC TRANSMITTER

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over Wire or Radio Circuits

MODEL RG RECORDER

TIMES FACSIMILE CORPORATION

A Subsidiary of
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Fort Monmouth chapter) and Captain Henry E. Bernstein, U. S. Navy. Mr. Clayton J. Held represents the Air Materiel Command of the Air Force.

The mission of the Standards Agency is four-fold:

1) To reduce the number of styles and types of electronic components used in the manufacture of military equipment of all kinds.
2) To insure their quality and dependability.
3) To achieve a high degree of interchangeability.
4) To designate approved sources of supply.

The Radio Manufacturers Association is cooperating wholeheartedly in implementing this program. A procedure for obtaining industry agreement on proposed "JAN" (Joint Army-Air-Navy) specifications was worked out by RMA and the Agency at a meeting held in New York at the time of the I. R. E. convention this year. Dr. W. R. G. Baker and Virgil M. Graham represented the Association and Col. Tatom and Capt. Bernstein in the Agency.

Considerable progress in alleviating the war-born confusion over electronic parts is being made. For instance, three standard crystal holders, to meet any foreseeable requirement, have been adopted to replace 350 different holders which were formerly used. A single standard wirewound resistor takes the place of 33 former non-standard types. Audio and power transformers that required more than 10,000 different sizes and shapes of cases can now be accommodated in only 22 standard containers. Measuring instruments and tubes have received the benefit of special attention. More than 37,500 types of meters have been reduced to 3,700 standard types, and 3,000 types of vacuum tubes have been cut down to 800 for replacement purposes and to about 200 for new applications.

CCAFA Host to Service Info Leaders

At its April 18th Army-Navy Club meeting, in Washington, D. C., the Coordinating Committee for Armed Forces Associations heard first hand from armed services information leaders what shape the new consolidated Military Establishment information department will take.

Present at the luncheon as guests were Major General Vernon E. Prichard, Chief, Public Information Division of the Army; Major General Charles W. Ryder, Special Assistant to the Chief of Staff for Civilian Components, of the Army; Brigadier General A. Robert Ginsburgh, Deputy Director (Military) of Public Relations of the Air Force (the Air Force has two deputy directors, one civilian, the other military); and Captain Harry E. Sears, Director, Public Information Division of the Navy.

On the matter of the new consolidated National Military Establishment information bureau General Ginsburgh bore the brunt of the queries from the committee, since he is one of the board working out the integration of the present various information divisions into a single center.

The outlining of the single information office was of especial interest to the Coordinating Committee insofar as it might affect their individual publications—as in the case of the AFCA's SIGNALS. Many stories and pictures for the publications are obtained from military sources and must be cleared through their information offices.

Prior to the delineation of the new central information office, the Coordinating Committee took advantage of the presence of Gen. Ryder to learn from him what could be done to gain credits for members of the Reserve who are active in Association affairs. Gen. Ryder's comments are reported in the Civilian Components news section.

Assistant to Johnson is Electronics Expert

James C. Evans, recently appointed as civilian assistant to Secretary of Defense Louis Johnson, has a distinguished record in electronics engineering.

A member of the Institute of Radio Engineers, American Institute of Electrical Engineers, American Association of University Professors, Mr. Evans was winner, in 1926, of the Harmon Award in Science, based on technical research in electronics and radar. He is executive secretary of the National Technical Association, and a member of the scientific fraternities Adelphian Club, Alpha Phi Alpha, Sigma Pi Phi, and Beta Kappa Chi.

In his new appointment Mr. Evans will work closely with the personnel policy board of the National Military Establishment for uniform procedures and practices in the three military departments to assure equality of treatment and opportunity for all military personnel. He also will be available to advise with Army, Navy and Air Force officials on personnel problems peculiar to the individual departments.

Mr. Evans served as Technical Training Specialist for the War Production Board and the War Manpower Commission from April 1941 to October 1942, when he was appointed assistant civilian aide to the Secretary of the Army. Following the unification of the armed forces he was designated adviser to the Secretary of Defense in October 1947.

Listed among education leaders in Who's Who in American Education, Mr. Evans is the holder of a Bachelor of Arts degree received at Roger Williams University, a Bachelor of Science and a Master of Science degree in Electrical Engineering at Massachusetts Institute of Technology.

From 1928 to 1941 Mr. Evans held the following positions at West Virginia State College: Professor of Electrical Engineering and Mathematics; Director of Trade and Technical Education, and Administrative Assistant to the President. He was granted leave by the institution in 1941 to enter government service.

Copperweld Appointments

The Copperweld Steel Co., Glassport, Pa., has announced the appointment of William W. Ege to the position of vice president-sales.

Long active in the power and communications fields throughout the U. S., Mr. Ege has wide sales and engineering experience. He was Copperweld's general manager of sales and prior to that was in the company's Chicago office in charge of western district sales.

Other promotions involve F. E. Leib, appointed assistant to vice president-sales, and P. A. Terrell, elevated to assistant vice president.

Mr. Leib was Copperweld's representative in Washington, D. C., for several years. Mr. Terrell has served in important sales and engineering capacities in Washington and Atlanta.

Former Rep. Andrews Dies

Walter G. Andrews, representative from New York for many years, who did much for military preparedness as the chairman of the House Armed Services Committee in the 80th Congress, died on March 6. He did not seek re-election to the Congress last year because of a heart condition.

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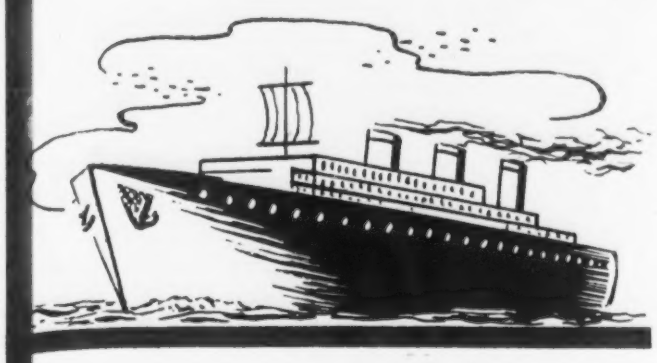

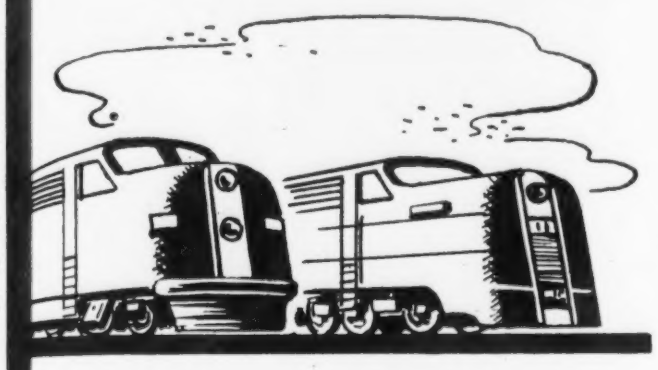

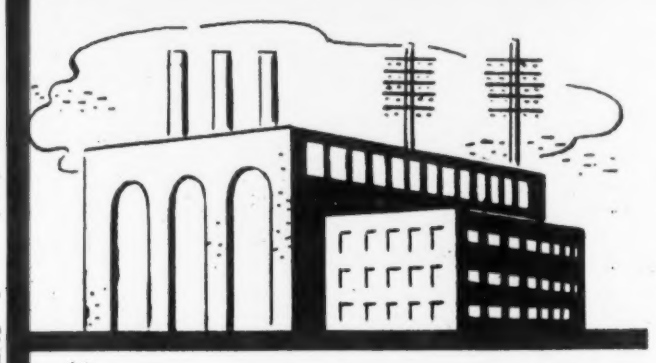

Choose Automatic Electric handsets for your wire or radio application. These highly-efficient handsets give you *job-matched* performance — transmission that's more efficient because it's geared to your service. Each of the many types is functionally designed for a particular application . . . and meets *all* the requirements of that application.

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On air-to-ground radio systems . . .
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In sound-powered systems for shipboard communication . . .
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This is Automatic Electric's Type 25 handset — lightweight, perfectly balanced, and available with characteristics for each specific purpose. Held in any position, at any angle, it transmits clearly and faithfully. Reception, too, is distinctly lifelike. This handset meets normal—and unusual—telephone requirements.

During most of his 18 years of service he had devoted his principal effort to strengthening our military position.

NAVY

Navy Electronics Conference

Electronics officers and civilian engineers from worldwide Naval activities met for a five day conference at the Main Navy Building, Washington, D. C., May 16-20. The conference was sponsored by the Bureau of Ships, Electronics Division, headed by Captain Alvin L. Becker.

The conferees, representing the Fleet, field activities, and the Bureau of Ships, gathered at the Navy Department to discuss common problems of electronics—technical, supply, and administrative.

Among the electronics problems brought forth in the five days of almost continuous discussion were those on communications presented in talks by Captain Wm. B. Ammon, Deputy Chief of Naval Communications, and Comdr. Donald C. Good. Captain Ammon addressed the group on future communications plans. Comdr. Good discussed the Shore Reserve Program in which he pointed out that current operable Navy communications equipments are now being used in training Reserve personnel and assisting them in becoming "hams."

Other topics presented were special electronics problems concerning the following: GCA Systems, Relay Links, Communication and Terminal Equipment, Sonar, Radiological Equipment, Industrial, USNA P.G. School Curriculum, Career Planning, Naval Air Stations, Installation Planning, Submarine, Reserve Fleet, Support of Outlying Shore Activities in the Pacific and the Atlantic, Maintenance, and Supply.

Oceanographic Panel Inspects Navy Electronics Lab

The Panel on Oceanography of the Research and Development Board of the National Military Establishment recently held a special panel meeting at La Jolla, California, and later inspected the work in oceanographic research being carried on by the Navy Electronics Laboratory at San Diego. The group also inspected the military research and development work of the Scripps Institute of Oceanography in the same area.

Created by the committee on geophysics and geography of the R and D Board, the panel concerns itself with oceanographic studies and the mutual relations existing between water, air and the land adjacent to it as they affect the problems of military research and development.

SIGNAL CORPS

Gen. Akin Inspects Camp Gordon

The Chamber of Commerce at Augusta, Ga., gave Maj. Gen. S. B. Akin, Chief Signal Officer of the Army, an important dinner and reception April 19 to commemorate his inspection of the Signal Corps Training Center at Camp Gordon, which was opened last November as part of the Army expansion program. At the same time the visit of General Akin inspired former "communicators" of the armed services to organize a local chapter of the Armed Forces Communications Association. General Akin inspected the center, which is commanded by Col. R. P. Lyman, and witnessed a review of the troops at the camp.

Signal Officers Visit Monmouth

Top signal officers from each of the six Army areas throughout the United States, Army Field Force signal officers, and ranking National Guard signalmen, were greeted at Fort Monmouth, N. J. on March 21st, by Major General F. H. Lanahan, Jr., Commanding General of Fort Monmouth, for an Army Signal officers' two-day conference.

Following an address of welcome by General Lanahan, the visiting group learned from Colonel Paul L. Neal, commanding officer of the Signal Corps Engineering Laboratories, just what the Signal Corps is doing in the research and development field of communications.

During their tour of the Signal Corps installation, which covers Coles, Evans and Squier Signal Laboratories, the group received a first-hand report on The Signal School, Signal Corps Publication Agency, Armed Forces Electro Standards Association, and the Signal Corps Board.

The signal officers also gave a report on their problems and needs. Conferences covered every phase of research, development, and training. Procurement, maintenance, and operation of equipment were discussed in an all-out effort to do a better job for the entire Armed Forces organization.

The group had luncheon in Company U messhall, were honored at a dinner in the evening and tendered an official farewell luncheon the following day.

Those attending were: Colonel Percival Wakeman, Colonel Arthur Pulsifer, Colonel Charles L. Olin, Colonel Richard B. Moran, Colonel James T. Watson, and Colonel Lloyd C. Parsons, of the Army Signal Officers; Colonel Frank Trew, Lieutenant Colonel Donald R. Bodine, of the Army Field Forces; Colonel Tyree Horne, Lieutenant Colonel Robert E. Quackenbush, of the National Guard Bureau; Colonel Rex Corput, Colonel Harry E. Storms, Colonel Benjamin Stern, Lieutenant Colonel Alvin Burke, Colonel Donald H. Nelson, of the Office of the Chief Signal Officer.

ACS to Get New Stations

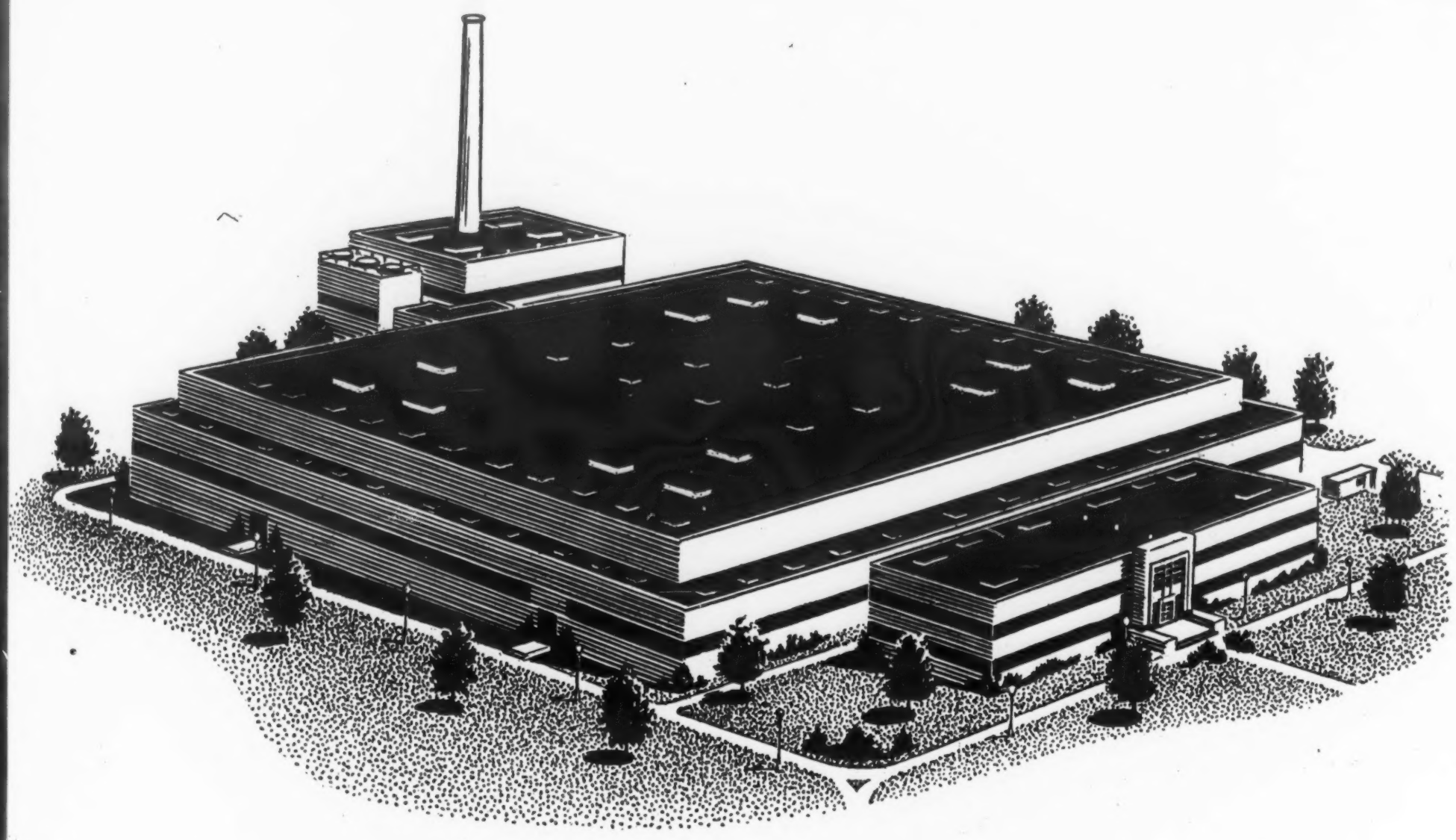
Improved facilities for the Alaska Communications System of the Army Signal Corps are to be built at 13 stations at a cost of $2,140,932 during the current fiscal year, Secretary of the Interior J. A. Krug said this week in a report on progress in Alaska.

SC Supply School Graduation

At the graduation exercises of the 14 officers of Class V of the Signal Corps Supply School on 2 March 1949 at Camp Holabird, Baltimore Md., Colonel Harry E. Storms, the Commandant, laid stress on the benefits the supply system would derive from the training received by the officers of the class.

To date, 76 officers have graduated from the school, which has been in operation since September 1946 under the jurisdiction of Brigadier General C. H. Arnold, Chief, Procurement and Distribution Division, Office of the Chief Signal Officer.

The mission of the school is to conduct instruction in Signal Corps depot operations, requirements and supply control, identification of equipment, management, and such



How this new plant helps Western Electric build dependability into electron tubes

IN the construction—and operation—of the new Western Electric plant at Allentown, Pa., every possible step has been taken to assure the quality and dependability essential in electron tubes. For instance:

Because even a few grains of dust trapped inside a tube may have a harmful effect on performance, dust is *locked out* of the new plant where Western Electric tubes are made. Air entering through the conditioning system is carefully filtered. Pressure of the atmosphere inside the plant is kept slightly above normal. When a door is opened, air moves *outward*, to block the entry of dust.

In this atmosphere of almost clinical cleanliness—under uniform conditions of temperature and humidity—highly skilled men and women working with the finest of manufacturing equipment build quality and dependability into Western Electric tubes.

— QUALITY COUNTS —

Western Electric

other related units of instruction as will enable selected officers to undertake supply duties with the Signal Corps. The school is also engaged in such special projects as coordination of the preparation of signal supply extension sub-courses for The Signal School, Fort Monmouth, N. J., furnishing signal supply training material and assistance in response to requests from both overseas and Zone of Interior agencies, and writing and arranging for the publication of supply texts for school use and distribution to other Army installations and services.

Captain John G. Moses is the Assistant Commandant of the school.

51st Sig Btn Anniversary

On 18 March the 51st Signal Operation Bn., stationed at Fort Meade, observed its 28th anniversary. This date commemorates the reorganization of the unit in 1921, when it received its present name. Actually, the battalion was activated in 1917 as the 51st Telegraph Battalion. The badge worn by its personnel and four of the streamers authorized for display with its colors—Lorraine, St. Mihiel, Meuse, and Argonne—were earned during World War I.

The history of the 51st since its reorganization in 1921 has been one of distinction.

Between world wars, the battalion gained fame in many ways. It participated in every Army maneuver during the period 1933-41. It was commended by the Secretary of the Navy for its assistance at the time of the "Hindenberg" disaster at Lakehurst in 1937. In that year also it set a world record for truck convoy movement of 222,688 truck miles—Fort Monmouth to Fort Sam Houston and return by a different route.

During World War II the battalion was awarded five additional streamers and the Distinguished Unit Plaque for its service in North Africa, Sicily and Italy, during the years 1943-1945.

Its present commander is Major Frederick D. Weis, whose first Army assignment was, by coincidence, to the same unit in 1936 as a private. Major Weis instituted again the ceremonies in commemoration of 51st Bn. Day which were an annual event when he first joined the unit at Fort Monmouth.

The celebration was climaxed by a cocktail party, dinner and dance at the Fort Meade Officers Club, to which former Battalion commanders and officers were invited and at which the honor guests included Lieut. General L. T. Gerow, Second Army Commander, and his deputy, Major General C. L. Mullins, who cut the Battalion birthday cake.

Old-timers of the 51st, who formed a 51st Signal Battalion Association two years ago, celebrated the Battalion's birthday with a special meeting at Fort Monmouth on April 16th. Louis Evans is the current president of the association. The reunion featured a dinner-dance at the Molly Pitcher Hotel at Red Bank.

CHANGES IN KEY PERSONNEL

Name & Rank	From	To
Brig. Gen. Harry Reichelderfer	Sig Corps Training Center Camp Gordon, Ga.	Dep CG, Ft. Monmouth, N. J.
(Primary wartime duty: Sig Officer, Sixth Army, Asiatic Pacific Theater)		
Col. Eugene V. Elder	Walter Reed General Hospital (patient)	P&D Div. OCSigO and designated Asst. Chief f/Proc. & Indust. Mob.
(Primary wartime duty: CO, Philadelphia Sig C Procurement District)		
Col. Edward F. French	European Command	2559 ASU, ORC Instructor Ft. Myer, Va.
(Primary wartime duty: Chief, Traffic Operations Branch, OCSigO)		
Col. Harold G. Hayes	Army Security Agency Arlington Hall Station	Signal Officer, US Army Alaska.
(Primary wartime duty: Chief, Intelligence Div., Arlington Hall Station, Va.)		
Col. Robert N. Kunz	D/A Personnel Records Board	Shipment Yokohama 20 May 49
(Primary wartime duty: Signal Officer, Hq XIII Corps, ETO)		
Col. Harold C. Miller		Asgd: Actg Chief, Sig Civ Components Div. OCSigO, 2 May 49
(Primary wartime duty: Dir., Procurement Div., Chicago Signal Depot)		
Col. Paul L. Neal	Hq. Ft. Monmouth, N. J.	Shipment FEC, 1 July 49
(Primary wartime duty: Signal Officer, Hq SOS, USAF, CBI Theater)		
Col. George F. Wooley, Jr.		Retired, 30 April 49 (as Brig. Gen.)
(Primary wartime duty: Signal Officer, Hq Seventh Army (as Brig. Gen.)		

**Selected as student 1949-50, National War College—Lt. Col. Charles M. Baer.

Colonel Theodore T. Teague, Signal Corps officer in charge of the radio station on Corregidor when the Philippines fell, and a prisoner of the Japanese thereafter until September 1945, retired from service 28 February 1949.

Colonel Paul C. Gripper, who has had considerable experience with industrial relations during his service with the Signal Corps and the Air Force, has replaced Col. F. W. Kunesh as Signal Corps member of the Communications and Electronics Equipment Committee of the Munitions Board.

Col. Stanley L. James

A survivor of the Bataan Death March, Col. Stanley L. James, USA, USMA '07, died 29 March, 1949, at Brooke General Hospital, Ft. Sam Houston, Texas.

He was commissioned originally in the infantry, but later transferred to the Signal Corps.

Following the Japanese attack against the Philippines, Colonel James was ordered to Bataan where he remained until the surrender, 9 April 1942. He was a prisoner for three and a half years before his rescue.

Colonel James is survived by his widow, Mrs. Stanley L. James of San Antonio, Texas; two daughters, Mrs. R. K. McDonough, Ft. Lewis, Wash., Mrs. P. R. Walters, Ft. Monroe, Va.; a son, Capt. Stanley L. James, Jr.; and eight grandchildren.

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Federal Two-Way FM Mobile Radio Makes Every Telephone a "Call-Box" for Police and Fire Protection

Great strides are being made in protection of life and property through municipal radio networks.

Outstanding is the great seaport of Baltimore—where clear, constant, static-free radio now covers the city with an "umbrella" of protection . . . an umbrella provided by a complete FM Mobile Radio system manufactured by Federal Telephone and Radio Corporation, an associate of the I T & T.

Just dial "O" from any telephone in Baltimore—for split-second help in an emergency. Federal transmitters stand ready for instant contact with 215 Federal mobile transmitter-receiver units installed in every type of Police Department vehicle and harbor patrol craft as well as Fire Department equipment including 10 ambulances and 5 fireboats. A million citizens benefit by the most vigilant and effective police and fire protection that science can provide.

Federal Mobile Radio Systems are also adding speed and operating efficiency to private enterprises such as taxi companies, bus companies and utilities.

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Associates of I T & T maintain electronic laboratories in the United States, England and France, and operate 31 manufacturing plants in 22 countries which are contributing immeasurably to the rehabilitation and expansion of communication facilities in a war-torn world.

WORLD UNDERSTANDING THROUGH WORLD COMMUNICATIONS

NEWS

Cadet "Hams" Visit Monmouth

Forty-five cadets of the United States Military Academy at West Point were recent guests of the Fort Monmouth Amateur Radio Club. The group, representatives of the West Point "ham" club, were to be followed later by a similar contingent.

Following formal welcome by Major General F. H. Lanahan, Jr., commanding general, the cadets were escorted by Col. W. A. Beaseley, of the Signal Corps Electronics Laboratories, Captain James L. Farmer, club president, and Captain C. R. Crossman, chief of the enlisted department's radar branch, on a tour of post installations.

While visiting Station K2USA, the most powerful amateur station in the world, cadets communicated with their home and overseas friends via shortwave. After a tour of enlisted department radio and radar installations the cadets were Gibbs Hall guests of West Point graduates stationed at Fort Monmouth.

The group was also taken on a tour of the Signal Corps Engineering Laboratories.

First Classmen among the visiting cadets were W. L. Schlosser, president of the Cadet Radio Club and cadet-in-charge of the visit; A. E. Fagg, J. D. Mitchell, J. F. Secay and E. Triner.

Signal Corps Writer Drowns

Harry M. Davis, science editor of *Newsweek* magazine, who recently met death by drowning while swimming at Biloxi, Mississippi, had an outstanding record as a writer with the Signal Corps during the war.

As a lieutenant with the special activities branch of the Signal Corps, Davis produced two volumes of official Army radar history which have become standard reference material in the military establishment. He was responsible for setting up the original Signal Corps Information Letter, and authored the book "What You Should Know About The Signal Corps" in the Norton series on the branches of the Army.

At the time of his death Davis held a commission as captain in the Signal Corps Reserve.

Signal Corps Simulates Tropic Climate For Tests

New electronic standards for the manufacture of ground communications equipment which can withstand nearly any tropical climatic condition have resulted from the development of the man-made "tropical rainforest" in operation at the Signal Corps Engineering Laboratories at Fort Monmouth, N. J. The simulated "rainforest" produces in its test chambers weather conditions ranging from a fine fog mist to a tropical torrent of two inches an hour, at temperatures ranging up to 190 degrees Fahrenheit.

As a result of the experiments, growth of fungi and corrosion on communications equipment can be promoted much as if it were exposed to the worst tropical weather conditions. Because of the tropical room's proximity to the Signal Corps arctic chambers, it is possible to subject equipment to both extremes of temperature in a matter of minutes, it was pointed out.

Expensive and time-consuming equatorial expeditions to test communications equipment have been made unnecessary, the Signal Corps said, and millions of dollars have been saved by the work. Newer and more efficient techniques and new materials for protection and packaging equipment also have been developed, it was noted.

Using wartime experiences and a Signal Corps postwar survey of communications equipment as the basis for further research, the tropical chamber tests have been of notable value in finding means to extend the life of many varieties of metals, fabrics, leather goods and electrical and electronic devices under tropical weather conditions, the Signal Corps disclosed.

AIR FORCE

"Zero Reader" Being Tested

The All-Weather Flying Division of the Air Force has begun preliminary tests and evaluation of a "breadboard" zero reader prior to delivery of experimental models in July, according to an announcement by officials of Sperry Gyroscope Company on April 6th.

It was revealed that the All-Weather division had placed a contract for three pilot models of the new gyroscopic flight instrument early in 1948, long before public announcement of the device was made.

Although the initial installation has been made in a C-54, Col. J. Francis Taylor, Jr., who heads up the All-Weather group based at Wilmington, Ohio, plans to emphasize evaluation of zero readers as an aid in navigating and landing fighter aircraft in all kinds of weather. His group has long been concerned with the problem of simplifying the presentation of cockpit information to pilots, especially the data used in all-weather landings.

Air Force tests of the zero reader will determine what the device will do for fighter pilots in making low approaches much below present minimums in conjunction with USAFILS or fixed beam landing system. Col. Taylor is in hopes that it will be the answer to the problem of bringing fighters in through low ceilings and visibility to where high intensity runway lights can be seen.

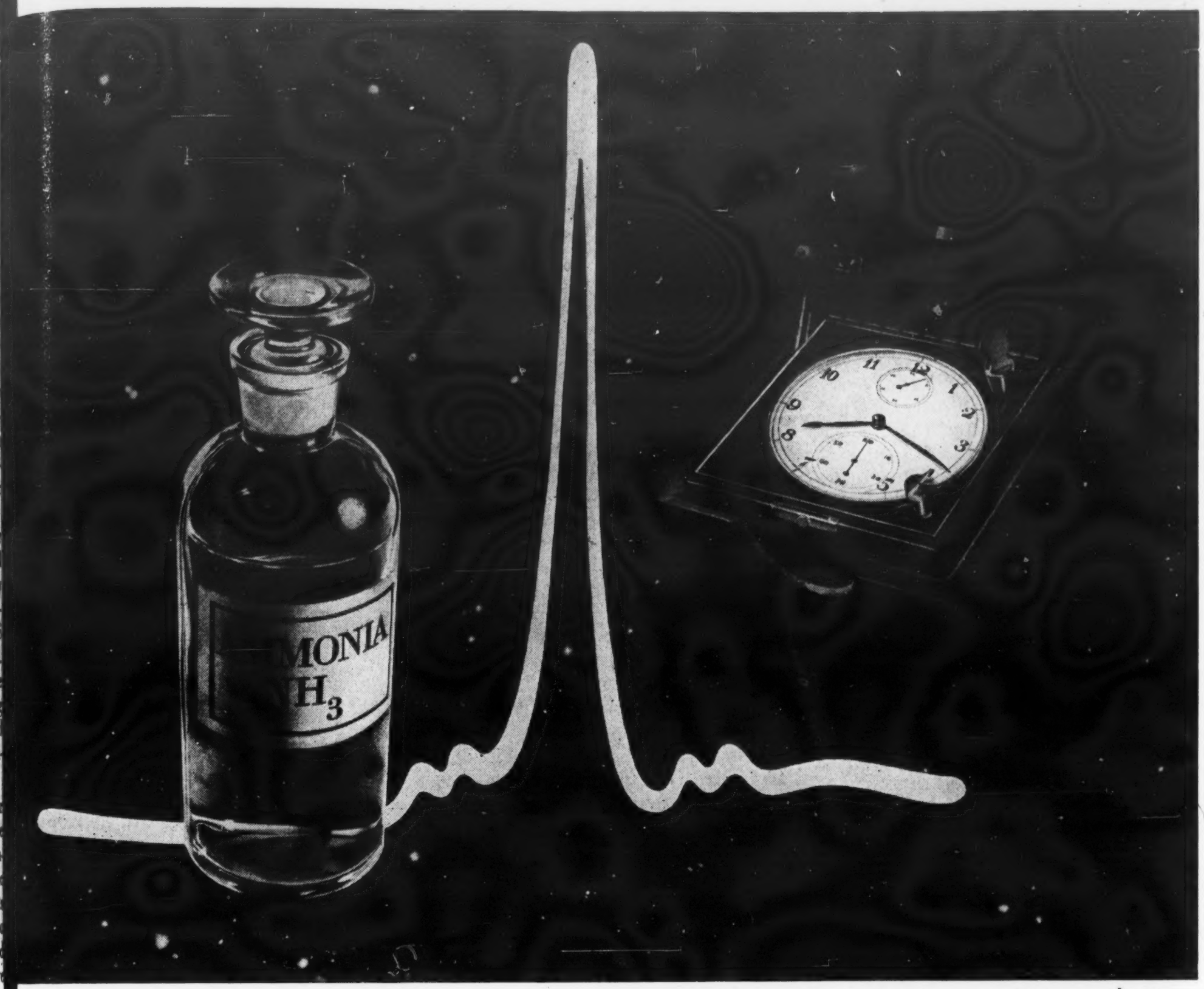
Despite additional tests by the Air Force in transport-type aircraft, the All-Weather Flying Division will continue to emphasize use of automatic approaches through automatic pilots for larger aircraft. Their aim is to bring larger aircraft in on a fixed beam with the automatic pilot, flare out the final approach, and bring the aircraft onto the runway to a full stop by automatic means. In such procedures the zero reader may serve as a reliable standby to the automatic system.

Sperry officials, discussing the history of the Air Force contract, stated that the All-Weather Flying Division had been working on the problem of combined cockpit instrumentation for almost four years. Sperry had been doing the same, and when the zero reader development began to

CHANGES IN KEY PERSONNEL

The following Air Force communications officers are graduating from the National War College in June, 1949, and are being reassigned as indicated below:

Name	Assignment
Colonel Thomas L. Bryan, Jr.	Air Communications Officer, Alaskan Air Command, Fort Richardson, Alaska
Colonel Raymond C. Maude	Vice Commander, Air Defense Command (Continental Air Command), Mitchell Air Force Base, N.Y.



Using ammonia and radio waves, RCA scientists have devised a clock more accurate than the stars.

Your future will run on "Atomic Time"

Imagine a clock which will lose or gain only one second in 20,000,000, and which – when further research is carried out – will vary no more than *a second in 30 years!*

Such a timepiece – constructed by the National Bureau of Standards on a principle conceived and demonstrated at RCA Laboratories – is now in operation. More accurate than the stars? Yes, because "star time" will vary when Mother Earth wobbles in her orbit.

The pendulum of RCA's clock is an atom . . . at present, the nitrogen atom in an ammonia molecule . . . though others may later be used. Vibrating at 23 billion 870 million times a second, it controls a system of radio waves and electrical impulses which operates the clock—locks them in tune with its own unvarying beat!

You will hardly want an "atomic clock" to get to the office promptly, or get your children to school. But scientists and engineers who must split seconds into millions of parts need this more accurate way of *telling time*.

The atomic clock is but *one* of the many major achievements pioneered at RCA Laboratories. Such leadership in science and engineering adds *value beyond price* to any product or service of RCA and RCA Victor.

* * *

Examples of the newest developments in radio, television, and electronics can be seen in action at RCA Exhibition Hall, 36 West 49th Street, N. Y. Admission is free. Radio Corporation of America. Radio City, N. Y. 20.

RADIO CORPORATION of AMERICA

World Leader in Radio — First in Television

Cadet "Hams" Visit Monmouth

Forty-five cadets of the United States Military Academy at West Point were recent guests of the Fort Monmouth Amateur Radio Club. The group, representatives of the West Point "ham" club, were to be followed later by a similar contingent.

Following formal welcome by Major General F. H. Lanahan, Jr., commanding general, the cadets were escorted by Col. W. A. Beaseley, of the Signal Corps Electronics Laboratories. Captain James L. Farmer, club president, and Captain C. R. Crossman, chief of the enlisted department's radar branch, on a tour of post installations.

While visiting Station K2USA, the most powerful amateur station in the world, cadets communicated with their home and overseas friends via shortwave. After a tour of enlisted department radio and radar installations the cadets were Gibbs Hall guests of West Point graduates stationed at Fort Monmouth.

The group was also taken on a tour of the Signal Corps Engineering Laboratories.

First Classmen among the visiting cadets were W. L. Schlosser, president of the Cadet Radio Club and cadet-in-charge of the visit; A. E. Fagg, J. D. Mitchell, J. F. Secay and E. Triner.

Signal Corps Writer Drowns

Harry M. Davis, science editor of *Newsweek* magazine, who recently met death by drowning while swimming at Biloxi, Mississippi, had an outstanding record as a writer with the Signal Corps during the war.

As a lieutenant with the special activities branch of the Signal Corps, Davis produced two volumes of official Army radar history which have become standard reference material in the military establishment. He was responsible for setting up the original Signal Corps Information Letter, and authored the book "What You Should Know About The Signal Corps" in the Norton series on the branches of the Army.

At the time of his death Davis held a commission as captain in the Signal Corps Reserve.

Signal Corps Simulates Tropic Climate For Tests

New electronic standards for the manufacture of ground communications equipment which can withstand nearly any tropical climatic condition have resulted from the development of the man-made "tropical rainforest" in operation at the Signal Corps Engineering Laboratories at Fort Monmouth, N. J. The simulated "rainforest" produces in its test chambers weather conditions ranging from a fine fog mist to a tropical torrent of two inches an hour, at temperatures ranging up to 190 degrees Fahrenheit.

As a result of the experiments, growth of fungi and corrosion on communications equipment can be promoted much as if it were exposed to the worst tropical weather conditions. Because of the tropical room's proximity to the Signal Corps arctic chambers, it is possible to subject equipment to both extremes of temperature in a matter of minutes, it was pointed out.

Expensive and time-consuming equatorial expeditions to test communications equipment have been made unnecessary, the Signal Corps said, and millions of dollars have been saved by the work. Newer and more efficient techniques and new materials for protection and packaging equipment also have been developed, it was noted.

Using wartime experiences and a Signal Corps postwar survey of communications equipment as the basis for further research, the tropical chamber tests have been of notable value in finding means to extend the life of many varieties of metals, fabrics, leather goods and electrical and electronic devices under tropical weather conditions, the Signal Corps disclosed.

AIR FORCE

"Zero Reader" Being Tested

The All-Weather Flying Division of the Air Force has begun preliminary tests and evaluation of a "breadboard" zero reader prior to delivery of experimental models in July, according to an announcement by officials of Sperry Gyroscope Company on April 6th.

It was revealed that the All-Weather division had placed a contract for three pilot models of the new gyroscopic flight instrument early in 1948, long before public announcement of the device was made.

Although the initial installation has been made in a C-54, Col. J. Francis Taylor, Jr., who heads up the All-Weather group based at Wilmington, Ohio, plans to emphasize evaluation of zero readers as an aid in navigating and landing fighter aircraft in all kinds of weather. His group has long been concerned with the problem of simplifying the presentation of cockpit information to pilots, especially the data used in all-weather landings.

Air Force tests of the zero reader will determine what the device will do for fighter pilots in making low approaches much below present minimums in conjunction with USAFILS or fixed beam landing system. Col. Taylor is in hopes that it will be the answer to the problem of bringing fighters in through low ceilings and visibility to where high-intensity runway lights can be seen.

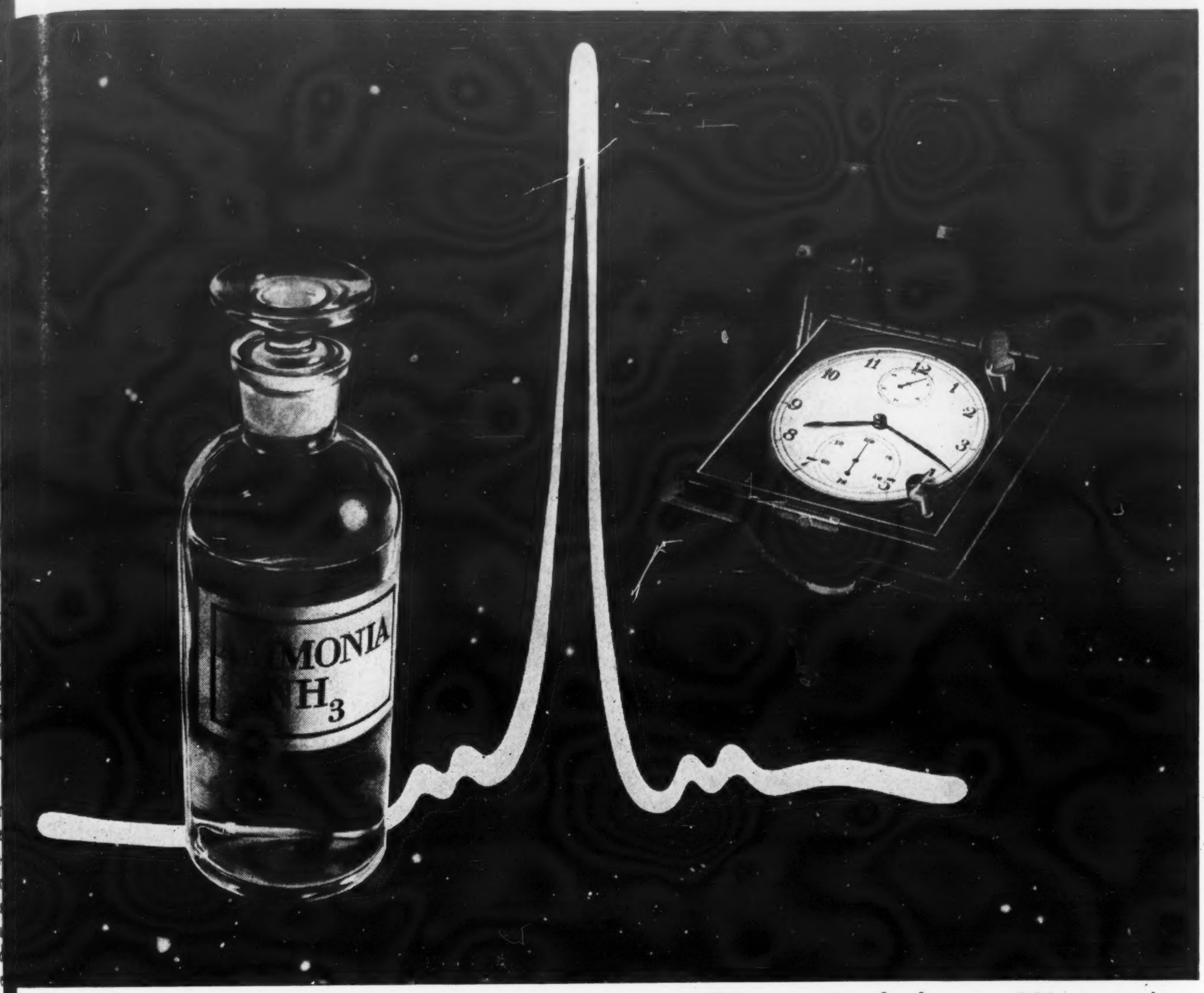
Despite additional tests by the Air Force in transport-type aircraft, the All-Weather Flying Division will continue to emphasize use of automatic approaches through automatic pilots for larger aircraft. Their aim is to bring larger aircraft in on a fixed beam with the automatic pilot, flare out the final approach, and bring the aircraft onto the runway to a full stop by automatic means. In such procedures the zero reader may serve as a reliable standby to the automatic system.

Sperry officials, discussing the history of the Air Force contract, stated that the All-Weather Flying Division had been working on the problem of combined cockpit instrumentation for almost four years. Sperry had been doing the same, and when the zero reader development began

CHANGES IN KEY PERSONNEL

The following Air Force communications officers are graduating from the National War College in June, 1949, and are being reassigned as indicated below:

Name	Assignment
Colonel Thomas L. Bryan, Jr.	Air Communications Officer, Alaskan Air Command, Fort Richardson, Alaska
Colonel Raymond C. Maude	Vice Commander, Air Defense Command (Continental Air Command), Mitchell Air Force Base, N.Y.



Using ammonia and radio waves, RCA scientists have devised a clock more accurate than the stars.

Your future will run on "Atomic Time"

Imagine a clock which will lose or gain only one second in 20,000,000, and which—when further research is carried out—will vary no more than *a second in 30 years!*

Such a timepiece—constructed by the National Bureau of Standards on a principle conceived and demonstrated at RCA Laboratories—is now in operation. More accurate than the stars? Yes, because "star time" will vary when Mother Earth wobbles in her orbit.

The pendulum of RCA's clock is an atom . . . at present, the nitrogen atom in an ammonia molecule . . . though others may later be used. Vibrating at 23 billion 870 million times a second, it controls a system of radio waves and electrical impulses which operates the clock—locks them in tune with its own unvarying beat!

You will hardly want an "atomic clock" to get to the office promptly, or get your children to school. But scientists and engineers who must split seconds into millions of parts need this more accurate way of *telling time.*

The atomic clock is but *one* of the many major achievements pioneered at RCA Laboratories. Such leadership in science and engineering adds *value beyond price* to any product or service of RCA and RCA Victor.

* * *

Examples of the newest developments in radio, television, and electronics can be seen in action at RCA Exhibition Hall, 36 West 49th Street, N. Y. Admission is free. Radio Corporation of America. Radio City, N. Y. 20.

RADIO CORPORATION of AMERICA

World Leader in Radio—First in Television

show real promise, the Air Force placed a contract early in 1948 for three pilot models for testing and evaluation. Deliveries against this contract will begin in July. Commercial airlines, which have shown extensive interest in the instrument, are scheduled to install zero readers next spring.

The zero reader has a simple two-element indicator with crossed-pointers which tell the pilot precisely how to move the controls to steer right or left or to go up or down. Sperry engineers point out that zero reader indication permits the human pilot to fly and navigate an aircraft manually with a degree of accuracy, precision and ease which approaches the performance of automatic control.

Types of cockpit information which are combined by the zero reader is that normally supplied by the gyro-horizon, directional gyro, magneto or gyrosyn compass, sensitive altimeter, and the instrument landing system cross-pointer meter. Other radio tracks may be added for cross-country navigation.

AFCA Exec Dir At Air University

Speaking before the students, instructors and staff of the Communication & Electronic Division, Special Staff School, Air University, at Gunter Base, Alabama on April 15, Brig. Gen. S. H. Sherrill, Executive Director of AFCA, emphasized the need for even closer relations between civilian communications developments and the services. After citing several examples of the importance of communications in battle throughout history, he pointed out that since our country will unquestionably be the first attacked by any future aggressor, our communications in the services, especially the Air Force, must be highly developed and ready *now*. That will necessitate, he said, still closer relations between science, industry, and the communications establishments in the armed forces.

Gen. Sherrill then explained how AFCA is acting as a vehicle to develop that closer cooperation. The objectives of the Association, he said, could be expressed in a single sentence: "To band together *all* communication minded Americans, in service and out, to ensure better military communications and to emphasize to those in authority the vital importance of communications so that they may never be overlooked."

The AFCA Executive Director stressed that perhaps the most valuable contribution that the Association makes is the introduction of personal contact between communicators of the services and of industry, at chapter meetings and the annual national meeting. "Just as our armed forces are made up in war of a much larger proportion of civilian soldiers, sailors and airmen than of professionals, so is our Association made up of more civilians than regular service personnel," he said. "But a large percentage of service personnel should be members as it is they who must lead the way in the Association's activities," he added.

After the lecture, Colonel Harold W. Grant, Director of the School, conducted General Sherrill through the school and explained the curriculum to him, with special explanation of the joint exercises at the end of the school year, which climax the courses of the entire Air University.

Changes in Key Personnel

Colonel W. M. Talbot, who was retired from the Army after the loss of his right hand as the result of an explosion of a "panzerfaust" in 1945 in Namur, has been recalled to active duty to direct the installation of the communications for the radar picket fence to be established in the United States by the Air Force. He will be on the staff of Major General Gordon Saville, the Air Defense commander at Mitchell Field, for about three years. During World War II he specialized in aircraft warning radar work for the Air Force both in the United States and the European theatre. Since his retirement he has been employed as a plant engineer with the Chesapeake & Potomac Telephone Company.

CIVILIAN COMPONENTS

AACS Reserves Visit Hq

Officers of an Airways and Air Communications Service reserve uit, soon to be formally organized in the New York area, visited Andrews AFB recently. The visit was part of the program under which AACS encourages its inactive officers to become familiar with new departments thru frequent visits to AACS installations. Invitation was extended by Maj. Gen. H. M. McClelland, Deputy Commander, Services, MATS.

Col. Guy C. Bittner, commanding officer of the unit and his staff were flown from Mitchell AFB to Andrews AFB. While there they were oriented and familiarized with headquarters MATS and other activities in the Washington area.

The group first visited MATS headquarters where they were briefed on current activities of the command. After the briefing, they were the guests of Brig. Gen. Wallace G. Smith, commanding officer, AACS, and his staff.

Gen. Smith briefly described current AACS activities and proposed plans for the future. He then invited the Wing commander and his staff to discuss pertinent problems with their opposite numbers of his staff. Later in the day the group toured important AACS facilities in the Washington area.

MARS Program Open to NG "Hams"

Amateur radio operators—"radio hams"—may now gain new experience and training in the National Guard as members of the Military Amateur Radio System.

Membership in the National Guard MARS—part of the recently authorized service-wide system which will establish amateur radio networks in the Army, Air Force, the Air and Army National Guard, Organized Reserve Corps and ROTC—is open to any Guardsmen or recruit who possesses an amateur radio operator's license.

Under the plan, operations of National Guard MARS will be part of the regular training programs for National Guard communications units and personnel. Equipment for MARS stations, which may be established at any of the Guard Armories or Air Bases, would be supplied by the United States Army and Air Force where necessary.

The National Guard network would fit into the nation-wide service MARS network in this way: National Guard MARS operators would work their own sets at home and would report in to their local MARS Station Director at the Armory or Air Base. The Station MARS Director would check into a state net by reporting in to the State MARS Director or Net Control Station—there will be one each for the Army and Air Guard in each state—who in turn would be netted into the numbered Army and Air Force MARS Directors. In the final check, the Headquarters MARS stations of the numbered Armies and Air Forces would net in with Army and Air Force Headquarters at Washington, D. C.

MARS activities would be in addi-

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tion to regular weekly armory training of the National Guard and purely on a voluntary basis.

"The MARS program should be an important factor in providing a reservoir of trained and qualified radio operators and maintenance men for the new National Guard," said Major General K. F. Cramer, National Guard Bureau Chief.

"It provides an unparalleled opportunity for radio 'hams' to become a part of the radio communications system that would play a vital part in the defense of the United States in case of emergency."

Amateur radio operators interested in participating in the MARS program and who can qualify for membership in the National Guard should contact the Adjutant General of their state or the nearest Guard armory or air base.

CCAFA Meeting Discusses Credits

Problems of Reserve credits were discussed with armed services information leaders at a luncheon of the Coordinating Committee for Armed Forces Associations at the Army-Navy Club, Washington, D. C., April 18th. (See story also in General News section.)

Guests of the Committee at the luncheon were Maj. Gen. Vernon E. Prichard, Chief, Public Information Division of the Army; Maj. Gen. Charles W. Ryder, Special Assistant to the Chief of Staff for Civilian Components, of the Army; Brig. Gen. A. Robert Ginsburgh, Deputy Director of Public Relations of the Air Force; and Captain Harry E. Sears, Director, Public Information Division, of the Navy.

As Deputy Information Chief for Civilian Components, General Ryder caught most of the Coordinating Committee's questions on the matter of Reserve members acquiring credits for activities in Association affairs.

General Ryder, in answer to the Committee's query, said that there are so many groups high-pressuring for Reserve pay—their only interest seems to be in pay—that the whole cause of acquiring credits is being harmed. He said, for instance, that some Reservists are attempting to acquire credits for their daily civilian occupational hours on the theory that they are performing the same essential work as they would in service. Also, the Civilian Components information chief said, some groups are lobbying for travel pay for attending various organizational meetings. These were examples of the various pressures being applied for credits which are harming the legitimate earning of credits.

In summing up, General Ryder said that he could not presently give an adequate answer regarding Reservists earning credits for Association activities, but that he would give the matter his attention and inform the Committee on his findings.

Any information so gained will be reported in these columns.

AF Decentralizing Reserve Records

The Air Force has transferred the personnel records of half a million Air Force Reservists from USAF headquarters in Washington, to the headquarters of the numbered Air Forces under Continental Air Command.

The transfer completed March 15, 1949, moved the records closer to the Reserve personnel concerned to allow more direct and personal administration of Reserve affairs.

Any change of address should be reported immediately to the appropriate Air Force headquarters to permit personnel records to follow the Reservists as soon as possible.

The Air Force to which the Reserve records were sent, and the states to be served by each, are as follows:

First Air Force, Fort Slocum, New York — Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

Fourth Air Force, Hamilton Air Force Base, San Rafael, California—Arizona, California, Idaho, Montana, Nevada, Oregon, Utah, and Washington.

Ninth Air Force, Langley Air Force Base, Hampton, Virginia—Delaware, District of Columbia, Kentucky, Maryland, Ohio, Pennsylvania, Virginia, and West Virginia.

Tenth Air Force, Fort Benjamin Harrison, Indiana—Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming.

Twelfth Air Force, Brooks Air Base, San Antonio, Texas—Arkansas, Louisiana, New Mexico, Oklahoma and Texas.

Fourteenth Air Force, Orlando Air Force Base, Florida—Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina and Tennessee.

AF Radar Course For Air NG

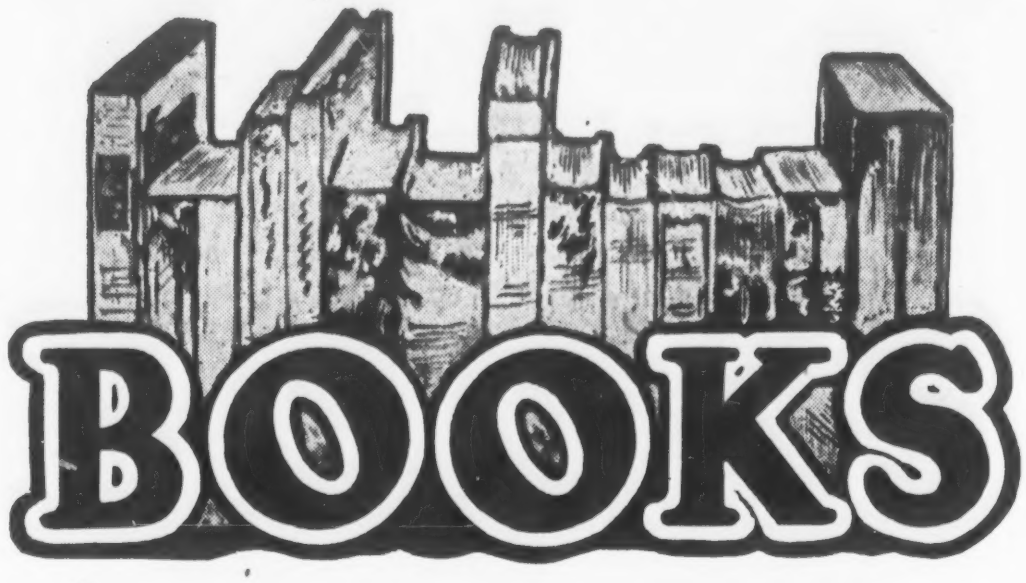
Technicians assigned to Air National Guard Aircraft Control and Warning Squadrons will be given thorough training in the use of the latest type radar equipment in a special course to be conducted by the U. S. Air Force at Keesler Air Force Base, Mississippi.

The air technicians, both officers and enlisted men, who serve in a full-time civilian capacity as well as in a National Guard status, will take a concentrated, comprehensive three-month course.

Classes of five men each, which the air technicians will attend in their civilian status, started in May. A new class will be begun each succeeding week until a total of 50 men are in training. Any vacancies will be filled by other members of the radar units, who will attend in their military status.

It is anticipated that graduates of the course will return to their units qualified as instructors, capable of organizing and supervising the training of radar mechanics and other instructors.

The radar network of the Air National Guard, which is strategically located throughout the continental United States, consists of 24 aircraft control and warning squadrons and 12 aircraft control squadrons. Of these, 22 aircraft control and warning squadrons and 11 aircraft control squadrons have been Federally recognized.



AND SERVICES

R. L. O'CONNOR, Secretary

WARTIME PRODUCTION CONTROLS, by David Novick, Melvin Anshen and W. C. Tuppner. Columbia University Press. 441 pages. Price $6.00.

Despite all-important questions of policy, the crux of wartime production control lies on the procedural level. Three men, each with many years' wartime government experience, here review critically the more important control techniques used in World War II, pointing out concrete steps that should be taken in any future similar emergency.

Twice within a single generation the American economy has been brought under centralized direction to secure maximum production for national defense. Yet, at the outbreak of World War II, we approached the problems facing us as if there were no reserve fund of experience upon which to draw. To prevent a repetition of this, Messrs. Novick, Anshen and Truppner give us a practical survey of the control methods tried, discarded, revised and enforced during World War II—which worked and which did not, and *why*.

They delineate the special economic problems created by war, and analyse in detail the strengths and weaknesses of the efforts designed to facilitate production: *priorities, allocations, conservation, limitation, scheduling, etc.*, taking into account the viewpoints of the business concerned and the agencies.

MACARTHUR'S JAPAN, by Russell Brines. Lippincott. 315 pages. Price $3.50.

MacArthur's Japan is a clear and absorbing description of a major military defeat upon an extraordinary people. It covers the entire spectrum of Japanese problems during the reconstruction period, commencing with the surrender ceremony aboard the *Missouri* and proceeding through the political, military and economic revolution which has taken place in Japan during the ensuing three years.

It is of passing interest to note that the book is not responsive to its title. The expression, *MacArthur's Japan*, indicates strongly that the burden of the volume should be a sympathetic recital of the influence exerted by Gen. MacArthur himself on post-war developments in the Japanese islands. Actually, the book rarely attempts to emphasize the contribution of MacArthur, presenting him in a reasonable and credible perspective, and crediting not him alone but the American system itself for the bulk of the success achieved during the occupation.

The author departs from this approach on one occasion—and with complete propriety—when he describes Gen. MacArthur's aggressive and inflexible determination to insure that the occupation would be fundamentally an American undertaking, stressing his vigorous, and at the same time clever, activities which resulted in the complete subordination of Russian influence in the formulation of occupation policy.

Mr. Brines, calling on extensive personal experience, gives a clear picture of the many unprecedented problems facing the Japanese nation. His discussion of the humanization of the emperor, for example, extends far beyond a simple account of the fundamental change in status of the Mikado, and gives the reader a clear insight into the character of a people who will accept their leader as superhuman for ten centuries and then obediently and upon the simple word of a conqueror, recognize him as a fallible, human equal.

The many volumes written during the war on the character of the Japanese soldier assume far greater realism in the light of Mr. Brines' account of these same Bushido-inflamed soldiers in time of peace. They are, he points out, individuals of very ordinary character, in the main having accepted their defeat philosophically, turning to a wide variety of normal pursuits, and uniting only in the conviction that insofar as war crimes were concerned, their only crime was defeat.

—Marine Corps Gazette

THOMAS: ROCK OF CHICKAMAUGA, by Richard O'Connor. 378 pages. Prentice-Hall. $4.00.

Shortly after the Civil War, Gen. William T. Sherman had this to say about his former West Point classmate: "The day is coming when . . . brave George Thomas will be the idol of the South. I predict it, Gentlemen." General Sherman was indeed far-seeing, for only now, some 84 years after the Civil War, is Gen. George Henry Thomas getting the recognition he so richly deserves. History records that no Civil War general was more important or more influential than Thomas, and yet he has been sadly neglected for all these years.

If General Thomas were alive today, he probably would not be surprised by this seeming neglect, as he experienced much the same thing during his military career. There are several contributing causes for his lack of public recognition. George Thomas was aloof from politics and was a quiet, self-contained individual. He refused to be drawn into the intrigue and scheming that catapulted a number of generals to fame. In addition, George Thomas was a Virginian by birth, who turned his back on his family and friends to remain loyal to the Union. Even this patriotic act, which must have caused him great personal grief, was viewed with considerable suspicion, and no less a personage than President Lincoln entertained doubts as to the loyalty of this outstanding soldier who contributed so heavily to Union victory.

After graduation from West Point, George Thomas spent his time trying to improve himself in his chosen profession. His first military duty was in the Florida Indian fighting against the Seminoles. He later gained his first real recognition as Field Artillery Lieutenant in the Mexican War. The artillery saved the day at Buena Vista, and the splendid work done by Thomas' section during that engagement was included in the official reports forwarded to Washington.

This study of General Thomas reveals him to be not only an extremely capable and valorous soldier, but an honest and sincere patriot as well. He earned the sobriquet, "Rock of Chickamauga," for his valiant leadership of his small corps at Chickamauga, where he saved the Union army from defeat as he stood alone against great odds while the remainder of the Cumber-

land Army retreated in disorder. His brilliant leadership and courage have never been contested.

It has never been possible for a commander to hoodwink his troops for very long. They are the first to know whether or not their commander is courageous and capable. George Thomas was beloved by the Army of the Cumberland, where he was affectionately referred to as "Old Pap."

This book will be of particular delight to all who are interested in the Civil War; however, it deserves a wider audience. It is difficult to conceive of a more interesting figure, and in *Thomas: Rock of Chickamauga*, Richard O'Connor has done full justice to his subject.

—*Field Artillery Journal.*

ELEVEN GENERALS: STUDIES IN AMERICAN COMMAND, by Fletcher Pratt. -Wm. Sloan Associates. Price on request.

Through the careers of eleven American commanders, in actions and campaigns from the Revolution through World War II, Mr. Pratt traces the development of the distinctive and original American contribution to the science of warfare. This contribution is the use of infantry, armed with individual weapons designed for aimed fire, as the major element in offensive operations. This theory, as applied and developed in action over the years, has been consistently successful against the widely varied military plans and methods it has had to confront.

RADIO AT ULTRA-HIGH FREQUENCIES, Volume II, edited by N. Goldsmith, F. Van Duck, Robert S. Burnap, Edward T. Dicky, and George M. K. Baker. RCA Review, RCA Laboratories Division. 485 pages, price $2.50.

A collection of papers and abstracts of papers prepared by RCA authors on practically all phases of ultra-high frequency generation, transmission and reception. These papers are reprints of material which has appeared in periodicals since 1940. The work is well arranged and indexed in one volume. Since the material presented in the book is not new, its technical content needs no comment, having previously withstood the test of publication.

As to the arrangement of the book, the material appears under seven headings entitled "Antennas and Transmission Lines," "Propagation," "Reception," "Radio Relays," "Microwaves," "Measurements and Components," and "Aids to Navigation."

In addition to the text proper, the book contains an excellent ultra-high frequency bibliography dating back to 1925, and a section containing summaries of the papers which appeared in Volume I of *Radio at Ultra-High Frequencies*, which is now out of print.

—*Journal, Franklin Institute.*

THE RECORDING AND REPRODUCTION OF SOUND, by Oliver Read. Howard W. Sams & Co., Inc. 304 pages. $5.00.

As editor of *Radio & Television News* for many years, Mr. Read has been able to analyze and appraise the host of circuits, equipment, accessories, and philosophies that have been developed about this extensive subject. An avid enthusiast on high fidelity recording and reproduction and a critical experimenter in all phases of the art, Mr. Read presents his material with the authority born from practical experience in his own laboratory, with all

INSIGNIA OF THE ASSOCIATION

AVAILABLE TO MEMBERS FROM THE SERVICE DEPARTMENT

The insignia of the Association in several beautiful designs and convenient styles authorized for wear by members is available at the prices quoted below. The insignia is described as follows:

The central figure is an alert powerful American eagle with strong talons clutching lightning flashes—symbolic of a strong America and national defense—especially insofar as modern communications is concerned, our basic reason for existence. The border consists of leaves of the olive branch of peace, showing that the object of military preparedness in America is to assure a lasting peace. In the background are signal flags—the first means of signalling in sea and land warfare by United States forces. Just above the eagle and between his outstretched wings is a heavy bomber in flight, symbolizing the complicated and essential communications in the Air Force, and in Naval and Marine aviation. Above that is a radar antenna array, and at the very top a radio relay antenna—for the latest major step in military communications. And none of these could exist without industry—the foundation of AFCA. In the color version there are the traditional colors of the signal flags—dexter white with red center and sinister red flag white center—with a gold border to the whole.

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Specify whether signal flags should be in red and white enamel or plain.

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types of record-playback equipment. Noted for his easy-to-read style of presenting technical information, his presentation of all phases of this subject is accomplished with unusual clarity. Evolving his subject from a complete history of sound and the behavior of sound waves, the author fully covers all basic media for making recordings with a detached analysis of their respective merits. Auxiliary equipment is fully covered and amply illustrated.

The handbook provides excellent coverage of acoustical systems for the reproduction of sound and a complete analysis of the various types of amplifiers, together with their individual applications.

PHOTOELECTRICITY, AND ITS APPLICATION, by V. K. Zworkin & E. G. Ramberg. John Wiley & Sons, Inc. 494 pages; $7.50.

This volume replaces the second edition of *Photocells and their Application*, by Dr. Zworykin and E. D. Wilson. It retains the aim of its predecessor—to present the reader with practical reliable data on the properties, preparation and applications of photoelectric devices. So many developments have taken place since the publication of the Zworykin-Wilson second edition that the new book is about twice as large.

Throughout *Photoelectricity* the emphasis is on practical aspects. This arrangement assures smooth continuity of the text by eliminating interruptions that the presentation of mathematical theory would produce. Formulas involved are included in footnotes.

TECHNIQUES IN EXPERIMENTAL ELECTRONICS, by C. H. Bachman. 252 pages. John Wiley & Sons, Inc. $3.50.

A STUDY of control, assembly, utilization, and techniques of working with controlled beams of charged particles in vacua or at very low pressures. This working manual gives the research scientist and the student the benefit of the author's wide experience in making all kinds of experimental electronic equipment. Here are techniques for the production and measurement of vacua; the preparation and design of glass tubulations; the production of glass seals; the preparation of cathodes and other electrodes; and the preparation and application of fluorescent materials. Background material and mathematical demonstrations are kept to a minimum. This is a practical volume, whose techniques can be put to work in your laboratory immediately.

SCIENTIFIC FOUNDATIONS OF VACUUM TECHNIQUES, by Saul Dushman. 846 pages. John Wiley & Sons, Inc. $15.00.

AN OUTSTANDING volume on the physical and chemical bases for high vacuum. This authoritative work is a fundamental study of all phases of achieving, maintaining and measuring high vacuum. It is clearly written and contains over 300 illustrations and a large number of tables useful in vacuum technique. It will be particularly valuable to physicists, chemists, mechanical engineers, metallurgists, and chemical engineers with a good background in the field.

Okinawa: The Last Battle

Book-of-the-Month Club News:
"It is impossible to avoid superlatives in characterizing this story of the conquest of Okinawa."

New York Times:
"... an outstanding success."

Philadelphia Inquirer:
"Okinawa will rank high on the massive bookshelf dealing with World War II."

Boston Herald:
"... recommend it without reservation."

Cleveland News:
"this book is a monument to the men who fought on Okinawa."

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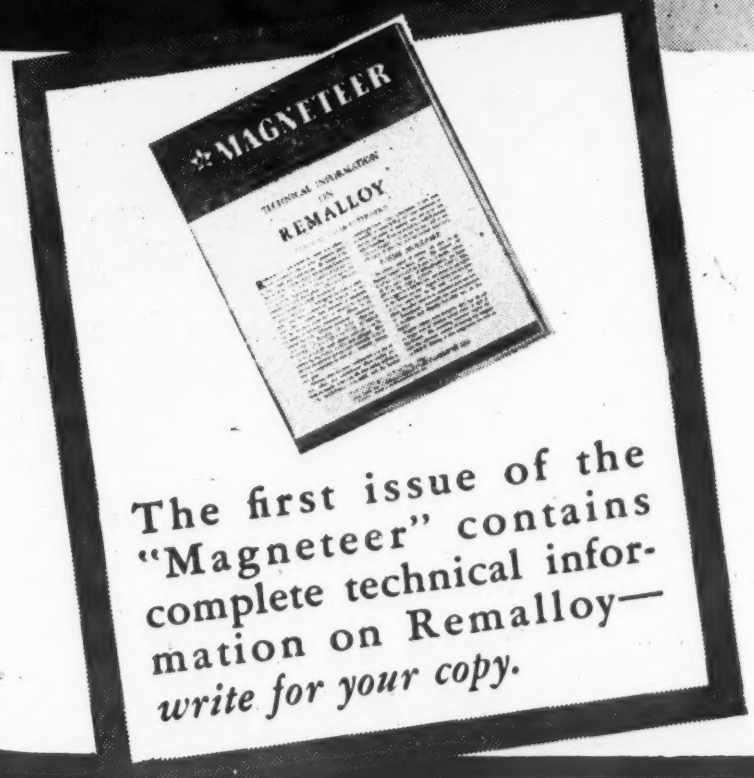

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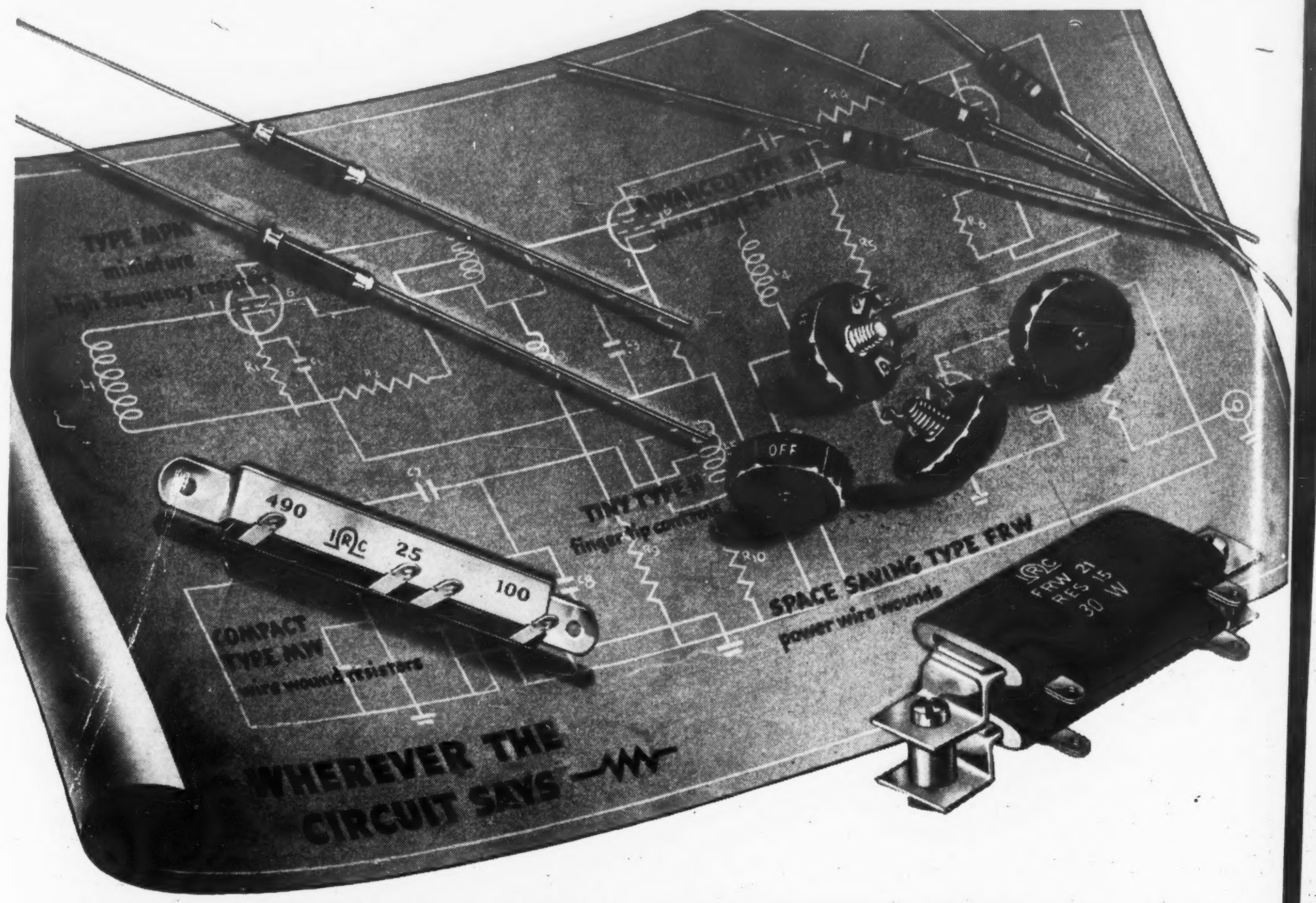

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